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BESNIER-BOECK'S DISEASE OR BENIGN LYMPHO-GRANULOMATOSIS OF SCHAUMANN (THE BESNIER-BOECK-SCHAUMANN SYNDROME).

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Historical Introduction and General Definition.

BESNIER-BOECK'S DISEASE is a chronic benign generalized granulomatous disease of unknown origin resembling tuberculosis. Certain phases of the disease have long been known, chiefly to dermatologists and ophthalmologists. Thus Jonathan Hutchinson,(36) in his "Illustrations of Clinical Surgery", described what is probably one of the skin lesions of the disease, referring to it as an "anomalous disease of the skin of the fingers, etc. (Papillary psoriasis?)". Here is Hutchinson's description, taken from his notes of the case, written in 1869:

> On the fronts of his legs, some of his fingers and on one forearm were a number of patches consisting in the first instance of distinct tubercles, which afterwards became confluent and then lost their tubercular character. The patches were peculiar chiefly on account of their dark purple colour; this tint seemed to depend partly upon venous congestion and partly upon deposit of colouring matter in the tissues, for although their margins could be made pale by pressure, no amount of squeezing altered the colour of the central parts. The patches were irregular in size and shape, distinctly raised above the general surface, their margins for the most part irregular and abruptly defined, and their surfaces smooth and almost glossy, or sometimes covered with thin dry epidermic scale. Their elevation above the surrounding skin was due in great part to œdema, for they could be made to pit by continued pressure, and in fact could be squeezed until almost all thickening disappeared. They were neither tender nor painful. The skin around them was slightly œdematous.

The coloured lithograph accompanying this description represents the hand of a man on which large, solid, livid patches of induration were present. Hutchinson states that while on a visit to Christiania in the same year in which he saw this patient, he was shown a drawing from a patient of

Professor Boeck showing a precisely similar condition.

In 1878 Hutchinson[37] described and illustrated in his "Archives of Surgery" what is almost certainly another of the types of skin lesion met with in this disease. He writes:

> The disease is characterized by the formation of multiple raised dusky-red patches which have no tendency to inflame or ulcerate. They are very persistent and extend but slowly. They occur in groups, and are usually on both sides and almost symmetrical. The multiplicity of the patches, their occurrence in groups, their bilateral symmetry and the absence of all tendency to ulcerate or form crusts, are the features which separate the malady from Lupus vulgaris. To none of the other forms of lupus has the malady any resemblance. The malady might perhaps be named Lupus Vulgaris Multiplex non-ulcerans, but for the present I prefer to recognize it, by the name of one of its subjects, as Mortimer's Malady.

Twenty years after Hutchinson recorded the first case above referred to, the French physician Besnier,[5] in 1889, and later Tenneson,[105] described in greater detail the corresponding lesion, consisting of purple patches of induration occurring typically on the nose, cheeks and ears, as well as on the fingers and toes, to which he gave the name *lupus pernio*, because of its resemblance to *lupus vulgaris* or *lupus erythematosus* on the one hand and to chilblain on the other. Ten years later, Boeck,[8] of Oslo, redescribed the second type of skin condition observed by Hutchinson, naming the lesions "cutaneous sarcoids". Boeck's sarcoids of the skin (or benign miliary lupoid, as they were later named by him) are of three varieties, the papular, the nodular and the diffuse infiltrating form, the latter being identical with *lupus pernio*. The papular variety consists of small reddish-brown papules, with a smooth surface or exhibiting some hyperkeratosis, occurring on the face, extensor surfaces of the arms, the back of the legs or the buttocks. Sometimes they occur as plaques not unlike those seen in *lichen planus*. Among French dermatologists the term "miliary lupoid" has been confined to this type of lesion instead of being used in the wider sense of Boeck, the term "sarcoid" being applied to the larger lesions only. Pautrier[71][72] has also pointed out that most of the lesions included in the category "miliary lupoid" exhibit necrosis and evidences of inflammation, and considers that they probably represent a variety of true tuberculosis of the skin akin to the papulo-necrotic type of tuberculide. Such lesions, unlike nodular sarcoids, are not accompanied by involvement of internal organs.[2]

There is, however, also a true miliary sarcoid[95] having the typical structure and clinical context of the lesions of the Besnier-Boeck-Schaumann syndrome. These are merely examples of nodular sarcoids in which the nodules happen to be exceptionally small (for example, size of a pin's head or of a pellet of buck-shot), taking on a lupoid aspect; and such lesions have been described by Pautrier himself.

The nodular sarcoids affect the face, trunk and limbs; the scalp, feet and hands usually escape. Their appearance depends upon the stage at which they are seen.[44][45] During the stage of eruption they consist of smooth, rounded, slightly elevated red or reddish blue, slightly tender nodules. This stage, according to Boeck, lasts about a fortnight and is seldom seen. It may be compared with the stage of eruption of *erythema nodosum*, and gives the impression of inflammation, which is otherwise foreign to sarcoids. During the florid stage the primary element increases in size, assuming the appearance of a cutaneous nodule, elevated about three to four millimetres above the surface, the average size being from that of a cherry seed to that of a hazel nut; some, however, may be as small as a pellet of buck-shot, while others may attain the diameter of a five-shilling piece. They take on a violaceous hue, and telangiectases may be seen on the surface. The surface is smooth and never ulcerates, and on it the dilated orifices of the sebaceous glands may often be seen. The nodules are firm in consistency, painless and not tender, while the skin over them is difficult to wrinkle. This stage is of long duration—up to twenty years.

The stage of involution is characterized by central cicatrization and flattening. The colour becomes darker, with deposit of brown pigment at the margins, while telangiectases remain. In uncomplicated cases the surface never ulcerates. Hudelo and Rabut[33] consider that *lupus pernio* (or *sarcolupus pernio* as they prefer to call it) has essentially the same characters as nodular sarcoids, only more diffuse and deeply infiltrating, the lesion extending after an initial nodular localization.

In 1924 Schaumann described another type of skin lesion which may possibly be a manifestation of the same disease, and to which he applied the name erythrodermia. The appearance presented by these lesions is that of large superficial serpiginous red areas occurring on the front of the legs and thighs.

All of the above skin lesions have been regarded by various dermatologists as "tuberculides". They have this in common, that when examined under glass pressure they are seen to consist of yellowish-brown miliary nodules, comparable with the nodules of *lupus vulgaris*, but less translucent and of firmer consistency.

Among the characteristic cutaneous lesions of this syndrome are the dystrophy and longitudinal striation of the finger nails and the infiltration and bluish-red discoloration of the skin (*lupus pernio*) in the neighbourhood of the interphalangeal joints, imparting to the fingers a spindle-shaped configuration not unlike that seen in tuberculous dactylitis—hence the name *pseudo-spina ventosa* which has sometimes been applied to the deformity.

Although Boeck[8][9][10] had recognized the association of enlargement of the lymph nodes with sarcoids of the skin and mucous membranes, it is chiefly to Schaumann,[90] of Stockholm (also Kuznitzky and Bittorf,[50] Kissmeyer[44] and Pautrier[70][71][73][75]), that we owe the conception of this condition as a generalized disease, constituting a distinct nosological entity and affecting nearly

every organ in the body. He gave to it the name benign lymphogranulomatosis.[92] Since not only the skin, but the bones, the lymphatic organs, the eyes, the lungs, and other viscera may be involved, the disease is one which is of general interest to the physician, as well as to the surgeon, the dermatologist, the ophthalmologist and other specialists. For the same reason it may occasion difficulties in diagnosis, and failure to recognize it may give rise to grave errors. The following cases, which have come under my notice, have special reference to the pulmonary manifestations of the disease and illustrate the difficulties which may be encountered in differentiating between this syndrome and healed or apyrexial miliary tuberculosis, if such exists. The presence of disseminated lesions in the lungs radiologically resembling those of miliary tuberculosis but not associated with pyrexia—the so-called "*granulie froide*" of Burnand and Sayé[12]—may be met with in a number of conditions, including healed miliary tuberculosis[32][7] (*sic*), leprosy, the pneumonokonioses, miliary carcinosis, vascular stasis, peribronchial sclerosis of various origins, chronic tuberculous bronchopneumonia with scattered foci, and Hodgkin's disease; but probably one of the most important causes, if not the most important, is Besnier-Boeck's disease.

Case Histories.

CASE I.—The patient, E.M., was a woman, aged twenty-five years, who for six months prior to her admission to the Royal Prince Alfred Hospital had suffered off and on from pain in the right iliac fossa. She was taken into a surgical ward with a view to being operated upon for chronic appendicitis; but as a precaution before operation a radiogram of the chest was taken on May 2, 1939, and the radiological report on the film was to the effect that the appearances were those of miliary tuberculosis. The operation was therefore abandoned and the patient was immediately transferred to a special tuberculosis ward among patients suffering from "open" tuberculosis. This fact is mentioned because it raises the possibility that in some of the recorded cases of mixed Besnier-Boeck's disease and pulmonary tuberculosis the patients may have acquired tuberculous infection subsequent to the appearance of Besnier-Boeck's disease as the result of segregation with tuberculous patients. When I saw the patient in consultation she seemed to all outward appearances to be a healthy looking young woman. Her pulse and temperature were normal and, so far from having lost weight, she had recently gained in weight. There was no history of cough, spit, hæmoptysis or night sweats, and the patient had not to her knowledge been in contact with any person suffering from pulmonary tuberculosis, nor was there any history of tuberculosis in the family. On physical examination of the chest no signs indicative of disease could be elicited. The X ray film (Figure I), however, showed a marbled or reticulated appearance of the lung fields, with disseminated lesions throughout both lungs, almost indistinguishable from those of miliary tuberculosis, but perhaps somewhat coarser. The changes were most marked in the lower lobes. The hilar nodes appeared to be considerably enlarged.

Systematic examination of the lymph nodes revealed the presence of enlarged nodes in both groins. These nodes varied in size from that of a small pea to that of a hazel nut; they were discrete, mobile, not tender, and of the consistency of india-rubber. No splenic enlargement could be detected and the liver was normal in size. No lesions were observed in the skin or the eyes, but the presence of enlargement of the lymph nodes, taken in conjunction with the radiological findings in the chest and the otherwise negative features of the case, led me to make the tentative diagnosis of Besnier-Boeck's disease, and further investigations, including biopsy of the lymph nodes, X-ray examination of the bones of the hands and feet, a tuberculin test and blood examination were suggested.

The X-ray examination of the extremities, the blood count and hæmoglobin estimation and the blood sedimentation test all yielded negative results; the total serum protein content was 8·1% and the albumin:globulin ratio 2·8. The significant findings were a negative response to the Mantoux test ("O.T." 1 in 10,000), and the presence of characteristic microscopic changes in the lymph nodes, by means of which the diagnosis of Besnier-Boeck's disease was verified. The lymph nodes were also stained for tubercle bacilli, but none could be detected, while inoculation of guinea-pigs and culture media with material from the affected nodes yielded negative results.

On microscopic examination the lymph nodes (Figures VII and VIII) showed the following changes. The lymphoid tissue was largely replaced by well-defined epithelioid tubercles, consisting of concentrically arranged epithelioid cells, having an abundant homogeneous protoplasm staining well with eosin. All stages could be observed in the fusion of these cells to form giant cells. In some of these the nuclei were situated peripherally, presenting a crescent-shaped arrangement, as in giant cells of the Langhans type; in others the nuclei were central and arranged in clumps, as in the giant cells associated with the presence of foreign bodies. There was a complete absence of any appearance suggestive of caseation or calcification. At the periphery of the nodules the lymphoid cells of the gland could be seen; but there was no sign of pathological reaction.

Further radiograms of the chest were taken at monthly intervals. For two months little, if any, change was observed; but the picture taken at the end of three months (August 15, 1939) showed a distinct clearing of the lung fields in the upper lobes, especially the left upper lobe. At the end of five months the lung fields had almost completely cleared (Figure II).

The patient has had no further attacks of pain in the right iliac fossa, and it is possible that her previous attacks may have been due to lesions of Besnier-Boeck's disease in the abdominal lymph nodes or in the appendix.

CASE II (Case II is Dr. Holmes à Court's case).—Mrs. F., aged fifty-seven years, was first seen by Dr. Holmes à Court on March 12, 1934, when she complained of a skin eruption which had been present for five years, and of shortness of breath on exertion, and of waking up at night with a cough and a desire to clear her throat. On examination she looked apparently healthy and somewhat obese. Copper-coloured plaques having a scaly surface were present on the skin of the shoulders, upper limbs and back. Râles were heard over the lower lobe of the left lung. The sputum contained no tubercle bacilli.

One of the skin lesions was removed for biopsy and examined by Dr. A. H. Tebbutt, who reported that the microscopic findings corresponded to those of Boeck's sarcoids.

The patient was treated with injections of "Solganol B". Two months later (May 12, 1934) the skin lesions had become lighter in colour, and during the following two months they gradually regressed.

Two years later (June 1, 1936), by which time the skin lesions had completely disappeared, the patient again came under observation on account of severe bronchitis. The physical signs in the chest were unaltered, but the patient complained of breathlessness and wheezing. X-ray examination of the chest at this time revealed the presence of miliary lesions of both lungs resembling those seen in miliary tuberculosis. These lesions were most marked in the lower lobes, the left upper lobe being least affected, so that the appearance was very similar to that seen in Case I after the lung fields had begun to clear.

Two years later, August 1, 1938, the patient died of intercurrent respiratory infection. There was no post-mortem examination.

The above may be regarded as proved cases of Besnier-Boeck's disease. In the next three the diagnosis cannot be said to have been firmly established, as no skin lesions were present and no biopsies were performed. Nevertheless, the radiological findings, the general course and character of the disease, and the negative result of the tuberculin test render this diagnosis probable.

CASE III (Case III is Dr. Bruce White's case).—F.L., aged forty-two years, was first seen in April, 1938, when she complained of cough, morning sickness and swelling of the joints of the hands, feet and knees, all of which came on after an influenza-like illness lasting some weeks. She also felt languid and unwell, and stated that she had lost one stone in weight in the course of the preceding year.

On examination she was found to be febrile, the temperature varying between 90° and 102° F. A few râles were heard over the base of the left lung. The sputum was scanty and contained no tubercle bacilli. Blood examination revealed the presence of a leucocytosis and some anæmia. The findings were as follows:

Red cells, per cubic millimetre	3,900,000
Hæmoglobin value	60%
Colour index	0·76
White cells, per cubic millimetre	14,500
Neutrophile cells	70%
Lymphocytes	18%
Monocytes	8%
Eosinophile cells	3·5%

The sedimentation rate was 25 millimetres per hour. No organisms were cultured from the blood.

X-ray examination of the chest showed the presence of fine mottling throughout both lungs. This remained unchanged or increased slightly for some months; but between September and December, 1938, the lung fields rapidly cleared, the clearing process beginning at the upper lobes and spreading downwards; the lesions persisted longest at the base of the left lung. In the hilar regions, shadows, due to enlarged lymph nodes, were to be seen. Radiography of the fingers and toes showed no abnormality.

The pyrexia subsided within four weeks of the date of the first examination, but the patient remained listless for about six months, gradually regaining her normal weight and energy.

In October, 1938, there occurred a symptomless enlargement of the cervical glands, which persisted for about six weeks. No other abnormalities were demonstrable. The Mantoux test gave no reaction.

The chief points of the case are the combination of glandular enlargement with miliary lesions in the lungs and the negative response to the Mantoux test, followed by disappearance of the pulmonary lesions and recovery.

CASE IV (Case IV is Dr. Bruce White's case).—This case somewhat resembles the preceding. The patient, J.L., was a boy, aged seven years, who complained of colds with cough off and on for four years, together with breathlessness, fatigue and sweats. There was very little sputum. No family history of tuberculosis was obtained.

Examination revealed a pale child, but beyond the presence of râles heard over both lungs, no abnormal physical signs could be elicited. His temperature was usually within normal limits, with occasional rises to 100° F. A leucocytosis of 14,600 was present. The sedimentation rate was 22 millimetres per hour, and the Mantoux test gave no reaction.

X-ray examination of the chest revealed extensive mottling of both lungs, with well-marked enlargement of the hilar nodes.

Between June and November, 1938, his condition gradually improved; the râles disappeared from the chest, the cough diminished, and the patient put on weight, until by the end of the year he looked extremely well. During the same period the mottling of the lung fields as seen radiographically diminished somewhat, although it was still quite extensive after six months. The enlargement of the hilar nodes persisted.

CASE V (Case V was Dr. Cotter Harvey's case).—The patient, a woman, aged twenty-three years, was first seen by Dr. Cotter Harvey in August, 1928, when she complained of cough and sputum of six months' duration, together with breathlessness, night sweats and some loss of weight.

On examination both pulse rate and temperature were found to be normal and, beyond an occasional rhonchus and some harsh vesicular breathing over the lungs, no abnormal physical signs could be elicited.

X-ray examination of the chest revealed (Figure III) a picture practically indistinguishable from that of miliary tuberculosis.

During 1929 her general health improved and she put on weight, while radiographically the lung fields showed some clearing, especially in the upper lobes. When examined in January, 1931, she appeared to be quite well and the mottling of the lung fields (Figure IV) had diminished very considerably, although a reticulated appearance remained, especially over the lower lobes.

During 1931 the patient became pregnant, and when she was examined during the fourth month it was found that the radiographic picture of miliary tuberculosis had reappeared (see Figure V), while the patient again complained of dyspnœa and night sweats. Four weeks after delivery the cough had almost gone, but the X-ray picture remained unchanged. Indeed, until the end of 1935 practically no change could be detected radiologically, although the patient exhibited no symptoms or signs and felt well. However, in 1936 a marked improvement in the lung condition set in, and by December of that year (see Figure VI) the mottling had almost disappeared, leaving, as before, a reticulated appearance, most marked in the left lower lobe. Hilar shadows, possibly due to enlarged glands, also remained. This state of affairs has persisted until the present time. The patient is now in robust health and rather obese.

If this condition was due to tuberculosis it would be necessary to suppose that the patient had miliary tuberculosis twice and recovered on each occasion. It seems much more probable that the mottling of the lungs was due to Besnier-Boeck's disease and that the lesions disappeared and reappeared just as may sarcoids of the skin.

The next three cases are put forward not as definite examples of Besnier-Boeck's disease, but in order further to illustrate the difficulty of distinguishing between Besnier-Boeck's disease and pulmonary tuberculosis. They form a series in which the probabilities are increasingly in favour of the diagnosis of pulmonary tuberculosis; but in none of them has the diagnosis been definitely established.

CASE VI (Case VI is Dr. Cotter Harvey's case).—The patient, D.P., a woman, aged thirty-three years, came under observation in January, 1938, when she complained of loss of energy and of having lost six pounds in weight within the preceding six months. Her father died of chronic pulmonary tuberculosis and her husband of tuberculous meningitis.

On physical examination no abnormality was detected. Temperature, pulse rate, leucocyte count and sedimentation rate were all normal. The patient never had any cough or sputum, and on physical examination of the chest no abnormal physical signs could be elicited. X-ray examination, however, showed an appearance similar to that of miliary tuberculosis. The hilar nodes were also considerably enlarged.

The Mantoux test gave a strongly positive reaction.

During the next twelve months the patient's health slowly improved and the lung fields began to clear from above downwards. On April 12, 1939, sixteen months after the first examination, an X-ray photograph of the chest showed that the lung fields had cleared almost entirely, except at the bases, where a reticulated appearance remained. The enlargement of the hilar glands had also subsided considerably.

The findings in this case are very suggestive of Besnier-Boeck's disease. Only the family history and the positive Mantoux reaction raise some doubts; but this evidence is purely circumstantial. The positive Mantoux reaction was only to be expected in a patient who had evidently been exposed to tuberculous infection; but it does not prove that the pulmonary lesions are due to tuberculosis. This patient had no enlarged superficial lymph nodes or cutaneous lesions which could have been subjected to biopsy, enabling a final diagnosis to be made.

CASE VII.—M.T., a woman, aged forty-two years, complained of a chronic cough which, she stated, had been present since childhood. For the last three years she had brought up a small amount of whitish sputum. There was a rather vague history of hæmoptysis on two occasions, once eight years ago and once two years ago. She had also had occasional night sweats during the past two years.

There was no family history of tuberculosis, nor had the patient to her knowledge been exposed to tuberculous infection. There was also no history of exposure to dust. The patient smokes immoderately.

On examination she appeared to be well nourished and no history of loss of weight was forthcoming. There was no abnormality to be made out on physical examination of the chest, and the sputum contained no tubercle bacilli. The Mantoux test gave no reaction. The leucocyte count was normal, with no shift to the left, and the sedimentation rate was likewise normal. There was no anæmia. The total plasma protein and the albumin:globulin ratio were within normal limits. No superficial lymph nodes were palpable.

X-ray examination of the chest revealed the presence of numerous small rounded opacities throughout both lungs, from which their density would appear to represent calcified miliary nodules. The phalanges of the hands and feet showed no radiological abnormality.

This case would appear to have a better claim than any of the preceding ones to be regarded as a genuine example of healed miliary tuberculosis. This diagnosis is based chiefly on the radiological findings, especially the evidence of calcification, and on the history of hæmoptysis. On the other hand, in respect of the negative features of the case—the failure to react to tuberculin, the absence of any febrile disturbance or history of fever and the chronicity of the condition, together with the general good state of the nutrition and the absence of loss of weight—the case resembles Besnier-Boeck's disease.

The question arises as to the precise interpretation of the radiological findings. The presence of calcified nodules would be a strong point in support of a diagnosis of healed tuberculosis, since calcification commonly supervenes upon caseation, and caseation is absent in Besnier-Boeck's disease; but while the shadows seen are suggestive of calcification, the actual presence of calcification cannot be said to have been demonstrated. It is just possible that the opacities may be due to dense sclerosis of disseminated sarcoids. However, granting the existence of calcification, does this exclude the possibility of Besnier-Boeck's disease? In other words, does calcification occur in Besnier-Boeck's disease? Snapper,[101] in his excellent monograph on this disease, states that it is "nearly always absent", which would seem to imply that it does sometimes occur; but this must be very rare, and I know of no instance in which it has been demonstrated and in which the possibility of complication with tuberculous infection could be excluded. Spencer and Warren[102] describe an autopsy on a case of Besnier-Boeck's disease in which section of the lower lobe of the lung showed "healed lesions resembling a primary tubercle with central caseation and calcification, and a peripheral zone of dense hyalinized connective tissue". The presence of caseation is, however, suggestive of tuberculous infection, and the case may have been one of combined tuberculosis and Besnier-Boeck's disease, of which there are several examples in the literature.[94][96] The issue must therefore remain undecided until more is known of the origin of Besnier-Boeck's disease and the possible results of secondary invasion of sarcoids with tubercle bacilli. This matter will be referred to again below.

As regards the alleged hæmoptysis, the history is not very convincing; and if bleeding occurred, it might have been due to the presence of sarcoids in the mucous membranes of the respiratory passages.

This case serves to emphasize the need for caution in diagnosing healed miliary tuberculosis and the difficulties which may arise in attempting to distinguish between that condition, if it exists, and Besnier-Boeck's disease.

CASE VIII.—The patient, E.F., aged thirty-one years, first came under observation on July 10, 1936, when he complained of pain in the right side, cough and night sweats. He had not lost weight.

On examination all the signs of right-sided pleural effusion were found, and this was confirmed radiologically. He was suspected of suffering from tuberculosis, but various tests, including examination of pleuritic fluid and sputum, both bacteriologically and cytologically, gave negative results. The Mantoux test gave a positive reaction. The pulse rate was increased, but there was no fever. No anæmia was present; the total number of white cells was 10,650 per cubic millimetre and the differential count was normal.

The previous health of the patient had been excellent and he had never suffered from any definite illness. There was no history of tuberculosis in the family, nor had the patient, as far as he was aware, been in contact with anyone suffering from pulmonary tuberculosis. His occupation was that of a carpenter.

As the effusion subsided, another radiograph, taken a month after the preceding one (August 25, 1936), revealed the presence of miliary lesions, especially in the right lung. In spite of this, his condition continued to improve and he did not lose weight. At another examination in three months' time (December 29, 1936) marked reticulation with irregular opacities in the lung fields was seen. One year later (December 3, 1937) the lung fields had cleared considerably and the condition has remained stationary up to the present time.

This case is almost certainly one of tuberculosis, although the final proof of this diagnosis is lacking.

Pleural effusions have not been a feature of the cases of Besnier-Boeck's disease so far reported, although pleural thickening and adhesions have been found;[96][81] and there are no other findings, such as changes in the lymph nodes, bones *et cetera* in this case to corroborate a diagnosis of that condition. The diagnosis is a radiological one and the X-ray film had been catalogued as an example of "healed miliary tuberculosis". However, the case again illustrates the desirability of exercising caution in interpreting shadows suggestive of "miliary lesions", especially in patients who are afebrile, as the shadows may not necessarily be due to miliary tuberculosis, and other possible causes, including Besnier-Boeck's disease, have to be considered.

The Essential Lesion.

The essential lesion is that above described in dealing with the microscopic findings in the lymph nodes in Case I (Figures VII and VIII). It consists of a nodular mass of epithelioid cells, usually concentrically, but sometimes radially, arranged, the nuclei of the epithelioid cells staining poorly with hæmatoxylin, while the protoplasm is abundant, homogeneous and stains well with eosin; a variable number of lymphocytes are present at the periphery; giant cells are present, and they may be either of the Langhans type, similar to those seen in tuberculosis, or of the foreign body type. The main points of differentiation from tuberculosis are the absence of caseation and of surrounding reaction, and especially the absence of neutrophile polymorphonuclear cells, which may be seen in early caseating tubercle. The giant cells also frequently contain many more nuclei (Figure VIII) and they are frequently arranged in clumps centrally placed, instead of being peripheral and crescentic in arrangement. Finally, tubercle bacilli cannot be demonstrated. With the silver impregnation method it has been found that a delicate reticulum is always present in the lesion, whereas in tuberculosis this is destroyed with the onset of caseation.[67] Healing of the epithelioid tubercle may take place by fibrosis or by *restitutio ad integrum*. It would be of importance for future investigation to settle the question as to whether necrosis and calcification ever occur in uncomplicated cases, as this may have some bearing upon the findings in cases such as Case VII of this series and that described by Spencer and Warren.[102] Kissmeyer[46] states that in uncomplicated cases caseation or necrosis never occurs, or with extremely rare exceptions, which would imply that it can occur.

Since accumulations of epithelioid cells constitute an invariable feature of Besnier-Boeck's disease wherever they occur in the body, it is evident that the disease is essentially a reticulo-endotheliosis.[96][98][99][101] The lesions are particularly prone to occur in lymphatic tissue—hence the frequent enlargement of lymphatic nodes and of the spleen—but they may occur in many other situations in which cells belonging to the reticulo-endothelial system are present, and it is probable that in these situations the epithelioid cells are frequently derived from the so-called "litoral" cells which are elements of the reticulo-endothelial system. This explains why they are frequently found in interstitial tissue. Lesions having the characters above described have been reported in the following situations: the mucosa of the mouth, upper respiratory passages, trachea, bronchi, conjunctiva and genitalia; the submucous tissue of the stomach and intestines,[96][3] and the lymphoid tissue of the intestines; the liver, pancreas, kidneys, heart, brain, optic nerve,[85] pituitary gland,[96] bone marrow, tendon sheaths,[96] pleura, lymphatic nodes, spleen, tonsils, testis, epididymis, prostate, breast,[26][98] salivary and lachrymal glands, the ciliary body and the iris.

In the lungs the smallest lesions are to be found in the alveolar septa (? walls), where, attached to a vessel, they produce a bulging of the alveolar wall, which may lead to partial or complete obliteration of one or more alveoli.[2][70][96] Larger foci, in the form of either tubercles or patches or streaks, may be present in the interlobular septa,[96] in the perivascular fibrous tissue or in the fibrous tissue around the smaller bronchioles, while some are situated in the subpleural fibrous tissue.[102] Pleural adhesions have been noted by Schaumann[96] and Rabut[82] in patients in whom no evidence of tuberculosis was present.

In the heart they have been demonstrated in the epicardium, the myocardium, the perivascular fibrous tissue and the sub-endocardial fibrous tissue. In the liver they are most numerous in the fibrous tissue of the portal tracts, relatively few being present in the middle zones of the lobules—a distribution the reverse of that met with in miliary tuberculosis.[102] Similarly, in the pancreas they are to be seen in the interacinous fibrous tissue, and in the testis they arise in the interstitial tissue. In the bones they occur in the reticulum of the marrow and they have been found not only in the phalanges, where the lesions give rise to a characteristic radiological picture, but also in the vertebral[96] and femoral bone marrow.[67] In the spleen the lesions may occur both in the Malpighian bodies and in the pulp.

Clinical Features of Regional Manifestations.

Major Regional Manifestations.

Lungs.—The cases above described serve to illustrate the main features of the pulmonary manifestations. The points to observe are that the miliary nodules frequently appear somewhat coarser than those of miliary tuberculosis, although this is not invariably the case, and that they often disappear. The greater involvement of the lower lobes and the tendency for the lung fields to clear from above downwards were features of the cases in the present series. The peculiar marbling or reticulation of the lung fields seen radiologically is characteristic and has been ascribed to the spread of epithelioid granulation tissues along vessels. This change may extend throughout the lungs, but is

frequently most marked near the hilum and in the medial part of the lower lobes. Fibrosis may set in, giving rise to denser shadows, while in some cases dense fibrous nodules may be seen. In advanced cases the radiological and clinical picture may resemble that of chronic fibroid phthisis or it may be mistaken for pneumonokoniosis.

Shortness of breath, cough, spit and a few râles may result from pulmonary lesions; but there may be an absence of any symptoms or signs whatsoever.

Cases with pulmonary localization and without any cutaneous lesions or recognizable involvement of bones or superficial lymph nodes are probably commoner than is generally supposed.

Lymph Nodes.—In any case of suspected Besnier-Boeck's disease a careful search for enlarged lymph nodes should be made, as the biopsy of a superficial node is one of the best ways of establishing the diagnosis. On palpation the nodes feel very much like those of Hodgkin's disease, and they vary in size from that of a pea to that of a cherry. The epitrochlear nodes should not be overlooked, as these are not infrequently affected. Particular stress is also to be laid upon the characteristic enlargement of the hilar nodes. This enlargement is sometimes so great as to suggest Hodgkin's disease, the swelling being in all probability largely due to œdema. It may occasionally cause pressure on a bronchus, with pulmonary collapse, and it may also be a cause of dry cough. Unlike those of Hodgkin's disease, the swollen glands do not subside under deep X-ray therapy.

Spleen and Tonsils.—Enlargement of the spleen and tonsils is less frequent than that of the superficial lymph nodes; but the spleen may be the site of special localization, when the enlargement may be mistaken for that of Hodgkin's disease, chronic lymphatic leuchæmia or even sarcoma.

Bones.—Of the various local manifestations, those next in importance to the pulmonary and lymphatic lesions, from a diagnostic point of view, are the changes in the hands and feet. The association between *lupus pernio* and changes in the bones was first noted by Kreibeck.[49] These changes do not necessarily give rise to any symptoms or signs, but are recognized radiologically. The appearances depend on the distribution of the lesions in the bone marrow reticulum—whether diffuse or localized. If they are diffuse and confluent, there may be a generalized osteoporosis of the bones, as seen radiologically, or the pathological process may spread along the Haversian canals, breaking down the trabeculæ and giving rise to a spongy, vesicular or worm-eaten appearance. If the lesions are disseminated but non-confluent, they give rise to a lattice-like aspect of the bone structure; if localized, they produce punched-out cyst-like areas of bone absorption, often shaped like the ace of hearts, towards the ends of the shaft of the phalanges. This last appearance is the most characteristic of all, and corresponds to the condition described by Jüngling[41][42] under the title *"Ostitis tuberculosa multiplex cystica"*, because of its supposed tuberculous origin. Kienböck,[43] who described the condition even earlier, thought it was syphilitic. Unlike tuberculous disease, the lesions occur characteristically at the ends of the phalanges; they do not involve either the periosteum or the joints; there is no pronounced perifocal sclerosis and there is no tendency to the formation of sequestra or fistulæ. The lesions are characterized by extreme chronicity and run an irregular course, advancing in some bones while undergoing involution in others. Complete healing (resolution) is possible. The changes in the bones of the phalanges are not uncommonly, but by no means invariably, accompanied by changes in the soft parts. This may be due to a concurrent and parallel infiltration of the soft parts (*lupus pernio*) and bones, without there being any direct connexion between the lesions in the two situations. Since there is usually very little swelling of the bones the deformity known as *pseudo-spina ventosa* deformity is almost always due to changes in the soft parts. According to Chevallier and Fiehrer[14] and Nielsen,[69] however, sarcoids may spread by continuity from the medulla of these bones, along the Haversian canals and ultimately infiltrate the soft parts, particularly the peritendinous tissue; but it is not clear how this occurs without involvement of the periosteum. Naegeli[65] describes a third atypical form, in which the primary change is in the soft parts and spreads to the bone, giving rise to periostitis *en route*. Spontaneous fracture of the phalanges may result from the bony changes;[69][2] more rarely, lesions may be demonstrable radiologically in the metatarsals, *os calcaneus*, the long bones (arm), the nasal and frontal bones, and in the acetabulum.[42][69][59] Bone lesions appear to be commoner in cold than in warm climates,[86] and this may account for their rarity in the cases so far encountered in Sydney.

Eyes.—Iridocyclitis is another important lesion in Besnier-Boeck's disease.[63][59][101] Most cases are mistaken for tuberculous iridocyclitis, and indeed one of the ways of discovering cases of Besnier-Boeck's disease is to examine patients who have been diagnosed as suffering from tuberculous iridocyclitis. The iridocyclitis of Besnier-Boeck's disease may have a favourable issue, but sometimes is followed by atrophy of the globe.[76]

Salivary and Lachrymal Glands.—Enlargement of the salivary and lachrymal glands is not uncommon. When iridocyclitis is combined with swelling of the parotid gland, and especially when this is complicated by facial paralysis, the combination is one which corresponds to the syndrome described by Heerfordt[30] and called by him uveoparotid fever.[99][59]

When the lachrymal as well as the salivary glands are affected, the condition has to be distinguished from Mikulicz's syndrome, and this may necessitate biopsy. Indeed, it is probable that many cases regarded as belonging to this syndrome, the ætiology

of which is evidently variable, were really cases of Besnier-Boeck's disease.[29][76]

Swelling of the parotid glands alone has caused the condition to be mistaken for mumps.

Minor Visceral Manifestations.

Mucous Membranes.—Lesions of the conjunctiva have the appearance of yellowish brown nodules, and their presence may cause œdema of the eyelids.[6] In the mouth and upper respiratory passages they look like opaque, yellowish white, solid nodules surrounded by a halo of hyperæmia or even plaques of a similar colour, sometimes with secondary ulceration.[55]

When lesions occur in the mucosa of the respiratory passages, they may give rise to cough, hoarseness, some catarrh and occasionally bleeding.

It is possible that peptic ulcer might result from localization in the duodenum or stomach, as in the case of Besnier-Boeck's disease recorded by Spencer and Warren.[102]

Liver.—Involvement of the liver may cause recognizable enlargement of that organ. Longcope and Pierson[59] record a case with recurrent attacks of jaundice.

Heart.—Lesions of the heart may be associated with changes in the character of the electrocardiogram—inversion of the *T* waves.[96] Salvesen[89] has noted bundle branch block, and it would be of interest to discover what role the disease plays in the production of various arrhythmias. Extrasystoles were observed by Schaumann.[96]

Brain.—Lesions of the brain may cause epileptic fits, and infiltration of the optic nerves has been reported to cause papillœdema and optic atrophy.[85][53]

Pituitary.—*Diabetes insipidus* has been observed by Schaumann.[96]

Kidneys.—Renal lesions may cause slight albuminuria[16][96] and the appearance of a few red corpuscles in the urine, but as a rule the urine contains no abnormal constituents.

Epididymis and Testicle.—Involvement of the epididymis and testicle may cause swellings of these organs.[59]

Constitutional Symptoms and Blood Changes.

The absence of any febrile disturbance or other evidence of toxæmia, in spite of apparently alarming lesions in the lungs and elsewhere, is a striking feature of the disease. In some cases, however, there may be febrile attacks which may last for weeks or months, the temperature seldom rising above 101° F., but occasionally reaching 103° F. Tiredness, night sweats and some loss of weight may also occur.

The blood picture may be quite normal, but occasionally some anæmia (hypochromic in type) and leucopenia are present. A shift to the left has been reported[101] even in the presence of leucopenia; but this was not a feature in the cases in the present series. Sometimes a leucocytosis occurs, particularly in patients exhibiting constitutional symptoms and in those suffering from bronchial catarrh or uveo-parotid fever. The exact significance of this is uncertain. It may, in some instances, be due to secondary infection.

Some investigators have observed a moderate mononucleosis[33][44][15][16] and occasionally an eosinophilia;[59][98] but this has not been a feature of our cases.

The sedimentation rate may be increased, but is frequently normal.

The blood proteins may be normal in total amount and relative proportions, as in the cases above reported; but Snapper[101] and Salvesen[89] have observed a relative increase in the globulin of the blood and also an increase in the total percentage of protein.

Prognosis.

The prognosis is good and the disease has a chronic course of up to twenty years' duration or more, and may undergo remissions and relapses. In cases in which pulmonary fibrosis occurs, death may result from right-sided heart failure. A mutilating and fatal form of *lupus pernio* has, however, been described by Chatellier.[13]

Ætiology.

There are three schools of thought regarding the ætiology of the disease. According to one, it is a form of tuberculosis; another holds that it is an ætiological entity, a disease *sui generis*; a third regards it as a non-specific tissue reaction to a number of different causes.

It is pointed out by those who uphold the tuberculosis hypothesis that some investigators have demonstrated tubercle bacilli in sarcoids of the skin[51][21][10] or have found active tuberculosis at autopsy on patients who have suffered from Besnier-Boeck's disease,[94][96][64] while others claim to have succeeded in producing tuberculosis in the guinea-pig with material from lesions,[42][11] particularly after repeated reinoculation.[94][82] Again, Jadassohn[38][39] has pointed out that in tuberculosis in the horse and in experimental tuberculosis of the skin of the rat the lesions have the sarcoid structure.

On the other hand, most observers have entirely failed to demonstrate tubercle bacilli in the lesions by microscopic examination, culture or inoculation of animals.[47][59][82] Tubercle bacilli are also absent from the sputum and urine, and they have not been demonstrated in the gastric contents even in patients suffering from pulmonary lesions.[101]

The rare presence of tubercle bacilli in sarcoids does not prove that they are responsible for the lesions, and the claim to their causal relationship resembles that which has previously been put forward on similar grounds for the tuberculous origin of Hodgkin's disease. In both Besnier-Boeck's disease and Hodgkin's disease the presence of tubercle bacilli in lesions is probably to be explained as a result of contamination or secondary invasion, in individuals who are also subjects of tuberculous infection,[87] just as tubercle bacilli may occasionally be found in cancer or abscess of the lung.[20] Similarly, the finding of both tuberculous disease and the lesions of Besnier-Boeck's disease at autopsy does not prove a common

ætiology, nor does it make it necessary to assume the substitution of the allergic for the anergic phase of tuberculosis, as suggested by Schaumann;[95] but it can be interpreted as the simultaneous occurrence of two diseases. It is even possible that damage to the lungs caused by the pulmonary localization of Besnier-Boeck's disease might light up old tuberculous foci. Another possibility is that tubercle bacilli might invade sarcoids of the lung and cause secondary caseation and calcification, at the same time becoming walled off by the sclerosing process. Such a state of affairs might explain the radiological findings in Case VII.

The question of contamination and secondary invasion of lesions with tubercle bacilli also arises in cases in which inoculation of guinea-pigs with sarcoids resulted in tuberculosis, since in at least some of them the patients were suffering from manifest tuberculosis of the lungs or were eliminating tubercle bacilli in the urine.[94][96] It should also be pointed out that tuberculous infection may occur in guinea-pigs kept for several months[82] if suitable precautions are not taken to isolate the animals from other guinea-pigs used as test objects and which may be suffering from tuberculosis. Failure to observe this precaution may account for some of the positive results, and even the same observer[54] has obtained positive results when these precautions were not observed, and negative results under the proper conditions. In this connexion it may be mentioned that the method of repeated reinoculation of guinea-pigs[82][94][96] is open to fallacies, and some of the positive results obtained may be due to laboratory infection. Apart, however, from experimental fallacies, it would appear that some of the cases[51][83] in which tubercle bacilli were cultivated from cutaneous sarcoids were not true examples of Besnier-Boeck's disease, the lesions being either of the "miliary lupoid" type, which is now admitted[71][86] to be tuberculous, or sarcoids of the Darier-Roussy type.[25]

The frequency with which the Mantoux test produces a negative response is regarded by many observers as strong evidence against the tuberculous origin of the disease. It is true that even in tuberculosis a certain percentage of non-reactors may be found, but not with the frequency observed in Besnier-Boeck's disease, and it would be most unusual to find patients with extensive disseminated tuberculous lesions in the lungs or multiple enlargement of lymph glands who did not react to tuberculin. The failure to react has been attributed by Jadassohn (senior) and others to "positive anergy". On the other hand, Kissmeyer[44][45] maintains that the response to tuberculin in Besnier-Boeck's disease is similar to that of non-tuberculous persons of the same age; but this is denied by Martenstein[60] and Beitema.[2] Again, patients with Besnier-Boeck's disease who acquire definite tuberculous infection may give a positive Mantoux reaction.[94][96] However, we have to set against this the recent observations of Lemming[52] upon the effect of inoculating patients suffering from Besnier-Boeck's disease with attenuated tubercle bacilli in the form of "B.C.G." vaccine. Lemming found that such inoculation did not result in the production of tuberculin allergy, in spite of marked enlargement of the lymphatic nodes in the area draining the site of injection. Tubercle bacilli could not be reisolated from the affected nodes, and it was regarded as suggestive that the microscopic changes in the nodes resembled those seen in Besnier-Boeck's disease. The failure to obtain secondary culture is not surprising, as this is a recognized difficulty in dealing with "B.C.G." vaccine. It is also unjustifiable to draw any far-reaching conclusions from the microscopic changes in the lymph nodes, since the patient was already suffering from Besnier-Boeck's disease with uveoparotid fever. We also require to know more about the production of tuberculin allergy by means of "B.C.G." vaccine in normal adult individuals who previously had shown no reaction to tuberculin. Such evidence as is available seems to show that in a certain proportion of adult individuals[97][19][31] (variously estimated at 11%,[19] 22%[97] and up to 72% to 85%[31]) tuberculin allergy fails to result from inoculation with the vaccine, while even in infants there may be about 25% of non-reactors. The experiment with "B.C.G." vaccine in Besnier-Boeck's disease would therefore have to be carried out on a sufficiently large series of cases in order to obtain adequate data for the statistical assessment of resistance. Lemming's observations are of interest, and it is desirable that they should be repeated.

Another argument which has been advanced against the tuberculous origin of the disease is that Besnier-Boeck's disease is common in Denmark, a country in which the incidence of tuberculosis is less than in any other in Europe. Moreover, the geographical distribution of Besnier-Boeck's disease within Denmark itself does not correspond to that of pulmonary tuberculosis, whereas that of *lupus vulgaris* does.[56] It would perhaps be unjustifiable to draw very far-reaching conclusions from the consideration of geographical distribution alone, since, as Werner Jadassohn points out, *lupus vulgaris* is uncommon in the United States of America although tuberculosis is common.

It must be concluded that at present there is no valid evidence that Besnier-Boeck's disease is caused by the tubercle bacillus.

The theory that Besnier-Boeck's disease is a disease *sui generis*[55][69][50][44][47] rests chiefly on the fact that it is apparently a nosological entity. The inevitable suggestion has been made that it is due to a virus, either the filtrable form of *Mycobacterium tuberculosis*[94] or another specific unknown virus. This, however, is purely a matter of speculation. Perhaps the resemblance of the lesions to those of *lymphogranuloma inguinale*, a virus disease, may encourage workers to attack the problem from this aspect.

Those who support the view that Besnier-Boeck's disease is a non-specific tissue reaction to a variety of different causative agents,[17][104][68][27][81] point to the similarity between the lesions found in this

disease and those which may be met with in tuberculosis, leprosy, syphilis, *lymphogranuloma inguinale*, leishmaniasis,[23][24] *granuloma annulare*[4] and the sarcoids of Darier and Roussy.[18] The resemblance of the lesions to those of leprosy is so great as to have led Rabello[79] to suggest that Besnier-Boeck's disease is actually a form of leprosy, the idea being that where leprosy is dying out or has disappeared in its ordinary form it may persist in the sarcoid form.[84] The similarity to leprosy applies not only to the skin lesions,[48][61][74] as in the tuberculoid or "sarcoid"[74] form of leprosy, but is said to extend to the radiological pictures of the changes in the bones[57][48][62][79] and the lungs;[79] Reenstierna[84] is sceptical regarding the latter. Besnier-Boeck's disease, however, does not produce lesions of the peripheral nerves, while leprosy does not cause enlargement of the lymph nodes or the systemic reactions met with in Besnier-Boeck's disease.

The sarcoids of Darier and Roussy[18] have a certain resemblance to Besnier-Boeck's disease in so far as they consist of nodules containing accumulation of epithelioid cells. But the lesions appear to be essentially inflammatory[71][73] and there is often considerable infiltration with lymphocytes and proliferation of vascular endothelium.[93] They are apparently of diverse ætiology—tuberculous, syphilitic *et cetera*. Their situation is in the subcutaneous adipose tissue, and this, in the majority of cases, serves to differentiate them from Besnier-Boeck's disease. Schaumann,[94][95][96] however, points out that confusion may arise owing to the fact that hypodermic lesions[66] may sometimes occur in benign lymphogranulomatosis, while Pautrier[73] and Halkin and Lapière[28] have drawn attention to the occasional herniation of cutaneous nodular sarcoids of Boeck into the subcutaneous tissue. But unlike Darier-Roussy sarcoids, Boeck's sarcoids, even when situated subcutaneously, are not accompanied by any trace of inflammatory reaction in the adipose tissue.[73] Unlike the sarcoids of Boeck, neither the sarcoid of Darier and Roussy nor *lymphogranuloma annulare* is found in association with the visceral lesions[95][77] now recognized as characteristic of Besnier-Boeck's disease, and the same applies to leishmaniasis and *lymphogranuloma inguinale*.

Treatment.

Among the remedies which have been reported to be followed by beneficial results are arsenic,[2] gold injections, chaulmoogra oil or antileprol,[57][58] large doses of vitamin *C* and various radiations. The recession of cutaneous sarcoids after treatment with "Solganol B" in Dr. Holmes à Court's patient (Case II) is of interest. However, in a disease which undergoes spontaneous remissions, it is very difficult to assess the value of any remedy except by the comparative study of a large number of cases with adequate controls.

Nomenclature.

The disease has been singularly unfortunate in its nomenclature. Eponymous terminology is objectionable at the best of times; but although it is uninformative, it at least has the advantage of being non-commital. The name Besnier-Boeck's disease, or *"la maladie de Besnier-Boeck"*, was adopted by the Congress of Dermatology in Strasburg in 1934, the disease being called after two of the dermatologists whose names have been associated with the cutaneous lesions, although they were not actually the first (compare Hutchinson) to describe them. If the disease is to be named after any individual, it should surely be Schaumann, who recognized that the manifold lesions, cutaneous and visceral, constitute a nosological entity. Schaumann's own name for it—benign lymphogranulomatosis—may lead to confusion with lymphogranuloma or Hodgkin's disease, and also *lymphogranuloma inguinale*. It also implies, erroneously, that the disease is essentially one affecting lymphatic tissue.

Other suggested names are Hutchinson-Boeck's disease,[35] Besnier-Boeck-Schaumann disease[96] or syndrome, Schaumann's syndrome,[84] Boeck's sarcoid or sarcoidosis and generalized sarcoidosis,[35] Boeck's disease,[44][69] benign reticulo-endotheliosis.[71]

The word "sarcoid" is also unfortunate, since the lesions are not flesh-like, nor have they any relation to sarcoma, and Gougerot's[27] suggestion that it should be used in an adjectival instead of a substantival sense does not improve matters. The term was originally introduced by Kaposi to signify tumours related to sarcoma; while Boeck, in adopting it, used it to describe a proliferation of connective tissue of unknown origin; but it no longer means either of these things. To add to the confusion, the term is also used in connexion with an entirely different condition, namely, the subcutaneous sarcoids of Darier and Roussy. Indeed, the dermatological congress which adopted the term Besnier-Boeck's disease, also decided to confine the use of the term sarcoid to the Darier-Roussy sarcoids.

Perhaps we shall have to wait until the ætiology of the disease is settled before a satisfactory name is found; but in the meantime we should be content with the eponymous terminology proposed by the dermatological congress in Strasburg, to which, however, should be added the name of Schaumann; and since it is not yet certain that the condition is a specific disease, it should provisionally be treated as a syndrome. Probably the best name would therefore be "the Besnier-Boeck-Schaumann syndrome".

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A NOTE ON THE MUSCULATURE OF THE HUMAN HEART AS ILLUSTRATED BY PATHOLOGICAL PROCESSES.

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SINCE the latter part of the seventeenth century there have been from time to time descriptions, written by anatomists, of the anatomical relationships of the muscle bundles of the ventricles of the human heart. Lower,[5] in 1669, described the superficial layers of muscle, distinguishing them as separate from the deeper layers. Cloquet[1] (1828) produced many diagrams showing an appreciation of the variety of muscle bundles and their planes. In the present century, Mall[6] (1910), Flett[2] (1927) and Robb[7] (1934) have again drawn attention to the anatomical relationships of the ventricular muscle fibres.

The detailed arrangements of these planes and groups of muscle fibres are complex, and the muscles described cannot easily be dissected out and demonstrated in the same way as can the muscles of a limb.

If these anatomical arrangements of the muscle bundles of the ventricle are considered of fundamental anatomical and physiological significance, then their accurate study is a matter of great clinical importance. Such a study can be carried out not only by anatomical dissections and physiological experiments, but also by observation of the distribution of pathological changes in the heart musculature.

In two previous papers[3][4] I have shown that laminar scars which are frequently seen in hearts at post-mortem examination correspond very closely with portions of the various muscle groups described by anatomists. These scars probably represent the end-result of infarction of cardiac muscle. It has been possible in these studies to

identify scars which correspond to large portions of the superficial sinospiral muscle, the superficial bulbospiral muscle, the deep bulbospiral and the deep sinospiral muscles.

To provide further proof of the structural importance of the ventricular muscle bands and their intimate relationships to particular branches of the coronary arteries, two instances of pathological processes showing a dependence upon the anatomical arrangement of the muscle fibres are described in this note.

The first specimen, number 76,[1] shows the distribution of petechial hæmorrhages in the ventricular muscle of a patient dying from acute leuchæmia.

The second specimen, number 54,[1] shows the path taken by blood escaping from the left ventricular cavity to the pericardial sac in a ruptured heart.[2]

Methods of Preparation.

The hearts were fixed in formalin solution and then cut into transverse slices about one centimetre thick. From these slices drawings have been made, showing the distribution of the pathological changes at various levels.

The drawings of the injected specimen were made as described in a previous paper.[(4)]

The Specimens.

Specimen 76.

Specimen 76 is the heart of a young girl who died from acute leuchæmia.

On external examination extensive subpericardial petechial hæmorrhages are seen. The hæmorrhages extend in a wide band from base to apex on the left side of the left ventricular wall. Transverse sections of the heart show that they extend into the musculature in a narrow subpericardial lamina from the apex almost to the auriculo-ventricular ring. A second lamina of hæmorrhages is to be seen under the endocardium, mainly on the medial surface, fusing with the superficial layer of hæmorrhages at the apex. This inner lamina also extends almost to the base of the ventricles.

In addition to the laminæ there is a wedge-shaped area of petechial hæmorrhages near the base of the ventricles extending from the pericardial region into the inter-ventricular septum.

The laminæ are well seen in the drawings of Figure I. In the lowest drawing is seen the communication of the two layers. In the top drawing the wedge-shaped area of hæmorrhage is evident.

The microscopic section of the cardiac muscle in the region of the hæmorrhages shows extravasations of blood cells lying in between the muscle fibre planes (Figure III).

Specimen 54.

Specimen 54 was obtained from an elderly woman who died suddenly three days after what was clinically considered to be a coronary occlusion.

On external examination the heart appears to have ruptured through the posterior wall of the right ventricle. Examination of serial macroscopic sections, however, shows the rupture to commence in the posterior wall of the left ventricle. The extravasated blood then passes along planes in the ventricular wall to reach the pericardial surface over the posterior aspect of the right ventricle.

The sections (Figure IV) show that the endocardial surface of the left ventricle is broken on the postero-medial aspect at a point one-third of the distance from apex to base. From this point the hæmorrhage spreads up and down in the substance of the left ventricular wall. It extends in the thickness of the wall almost from base to apex. Laterally it extends in a lamina of varying width at different levels.

In the lower portion of the upper half the plane of hæmorrhage extends into the interventricular septum. In the drawing second from the top the point of emergence to the pericardium is illustrated. The drawing third from the bottom shows the site of exit of the blood from the ventricular cavity. In the lower half of the ventricles the plane of hæmorrhage is more superficial than in the upper portion.

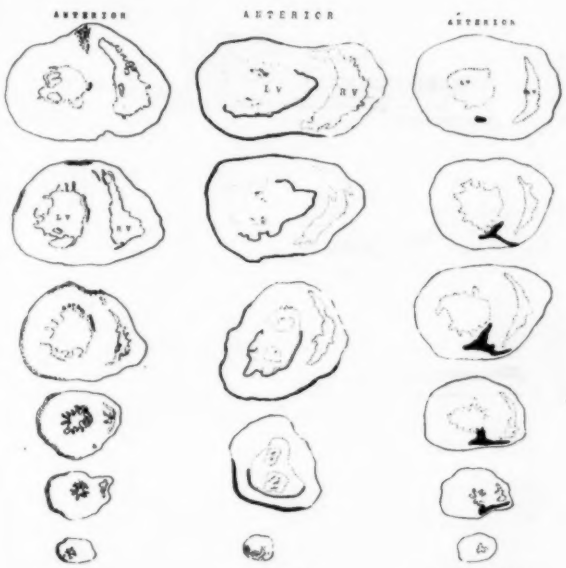

FIGURE I. Diagrammatic reconstruction of the areas of petechial hæmorrhages seen in Specimen 76.

FIGURE II. Diagrammatic reconstruction of the distribution of the superficial bulbospiral muscle.

FIGURE IV. Diagrammatic reconstruction of the path taken by the blood in the rupture of the left ventricle in Specimen 54.

In addition to the hæmorrhage there is some patchy fibrosis in the lateral wall of the left ventricle. Examination of the coronary arteries reveals pronounced atheromatous changes, but no complete obstruction of either of the three main branches can be demonstrated. Microscopic sections through the region of hæmorrhage show masses of blood cells in between muscle planes.

The electrocardiogram taken two days after the onset of the illness is shown in Figure V.

Comments.

These two specimens illustrate the value of studying pathological processes in attempts to elucidate difficult anatomical problems. In each instance a pathological change has occurred in the heart, and its distribution has been determined by anatomical arrangements of the arteries and muscle bundles in the ventricular wall.

In Specimen 76 the petechial hæmorrhages indicate some change in the capillaries of the region

[1] The specimen numbers refer to the serial numbers of the hearts examined in the course of this and other investigations.

[2] The anatomical nomenclature of these muscles is that employed by Robb (1934).

affected. As this change is not uniform throughout the organ it may possibly be correlated with the field of supply of one or more branches of the coronary arteries.

The reconstruction drawings show that the hæmorrhages mark out a large portion of the superficial bulbospiral muscle (Figure II), with, in addition, a wedge-shaped area of tissue near the base of the heart, and therefore their distribution is the same as that of the artery supplying this muscle.

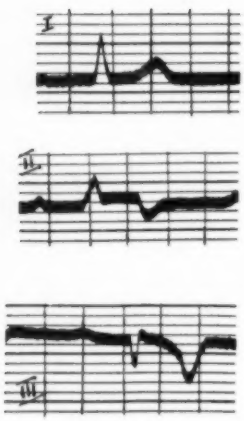

FIGURE V.

The electrocardiogram of Specimen 54.

FIGURE VI.

Diagrammatic reconstruction of an injection of coloured gelatine into a portion of the superficial bulbospiral muscle. (*A* indicates the site of the arterial injection.)

Experiments (Figure VI) show that it is possible to inject gelatine masses into the capillaries of one muscle bundle by choosing a suitable arterial branch for the injection. Such experimental injections also produce a wedge-shaped area of injection, similar to the wedge seen in Specimen 76, at the level of the injection.

This specimen therefore provides evidence that naturally occurring processes may be confined to the vessels of one muscle bundle. It also supports the conclusion drawn from injection experiments that such muscle groups have blood supplies which are normally functionally independent of other muscles.

These observations also suggest that in certain circumstances these vessels may supply wedge-shaped areas of tissue outside the field of one muscle.

In Specimen 54 the path taken by the blood from the ventricular cavity to the exterior is obviously determined by some anatomical feature of the ventricular wall. The passage of the blood between the planes of muscle bundles would give such a distribution of hæmorrhage as is seen, and it is almost certain that such is the anatomical feature determining the path. Below this level the blood extends laterally and longitudinally beneath the fibres of these two muscles, but does not penetrate them.

In this case the events which took place may be reconstructed. Three days before death the patient is reported to have had a coronary occlusion. This would result in the production of an infarct in the wall of the left ventricle, which did not involve the whole wall. The electrocardiographic tracing taken on the second day is not typical of posterior wall infarctions, resembling more closely the tracing from a lesion of one or more of the deep muscles of the ventricular wall. On the third day of the illness the patient died suddenly, presumably because the thin layer of muscle separating the infarct from the ventricular cavity gave way and blood was forced into the musculature of the wall. It spread through the softening infarct and then along the muscle planes, breaking into the pericardial sac at the weakest point, the line of junction between the two superficial muscles.

Summary.

1. The distribution of petechial hæmorrhages in the ventricular muscle of the heart, from a case of acute leuchæmia, is considered in detail. The hæmorrhages are shown to have occurred from the vessels supplying the superficial bulbospiral muscle.

2. The path taken by blood in escaping from the left ventricle of the heart, in a case of rupture of the left ventricle, is described. This path is shown to be determined, in part, by the arrangement of the muscle planes.

3. These cases are recorded as additional evidence that the muscles of the ventricles are anatomical and physiological entities.

Acknowledgements.

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ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR C. G. LAMBIE.

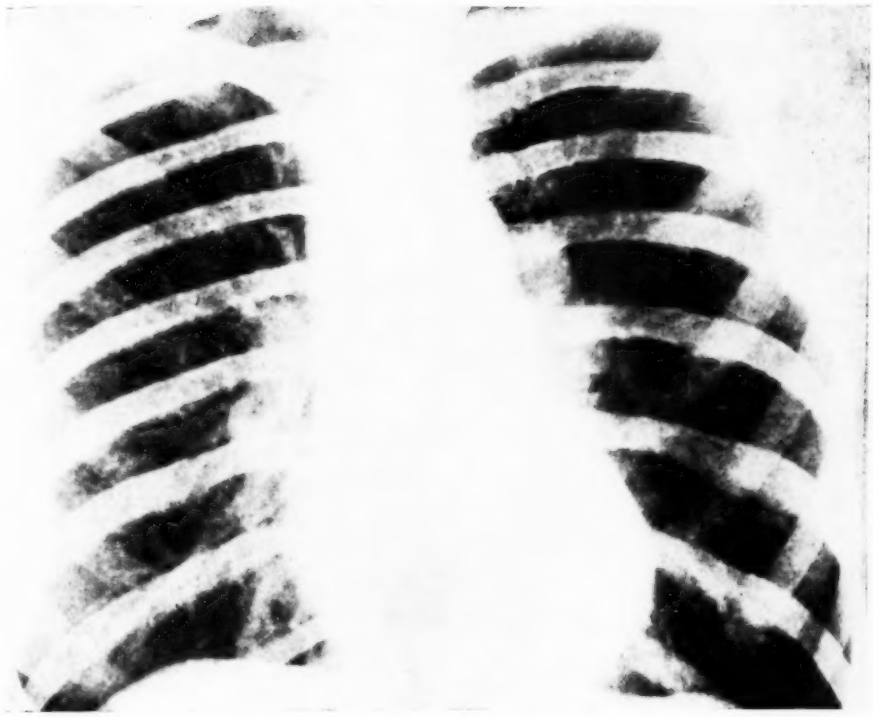


FIGURE I.

Case I. Showing marbling and miliary lesions throughout lung fields, together with hilar shadows due to enlarged lymph nodes.

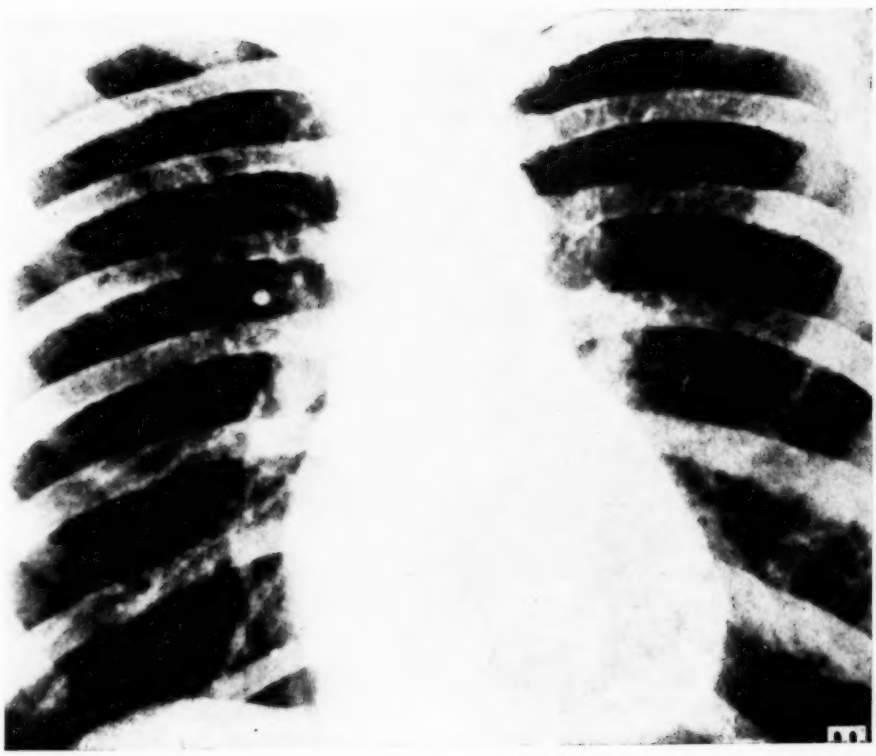


FIGURE II.

Case I. X-ray photograph taken five months after that shown in Figure I. Clearing of lung fields and diminution of hilar shadows.

ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR C. G. LAMBIE.

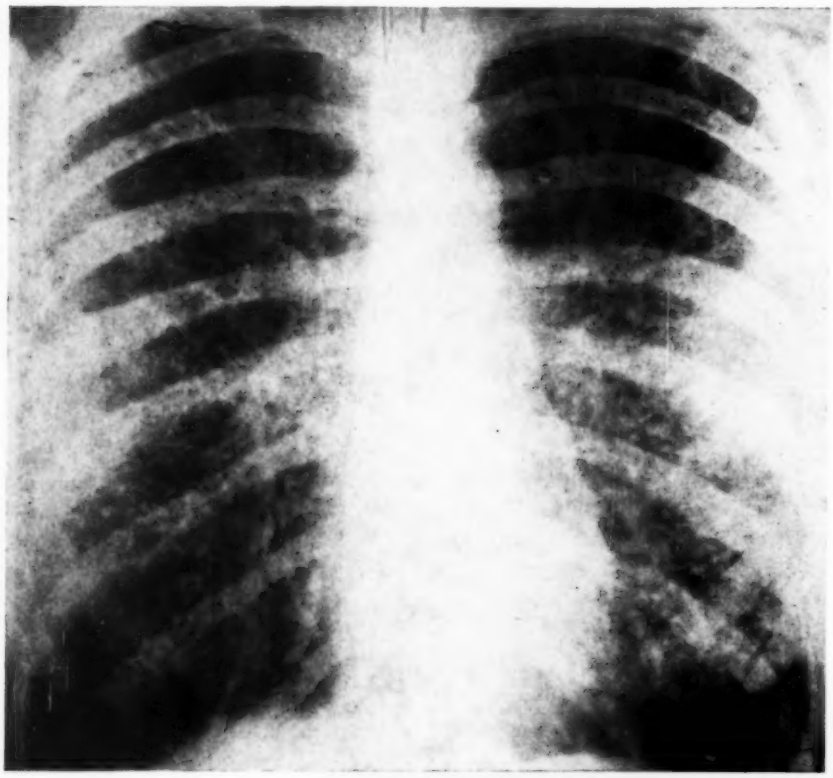


FIGURE III.

Case V. Skiagram, August, 1928, showing miliary lesions throughout both lungs, the lower lobes being most affected.

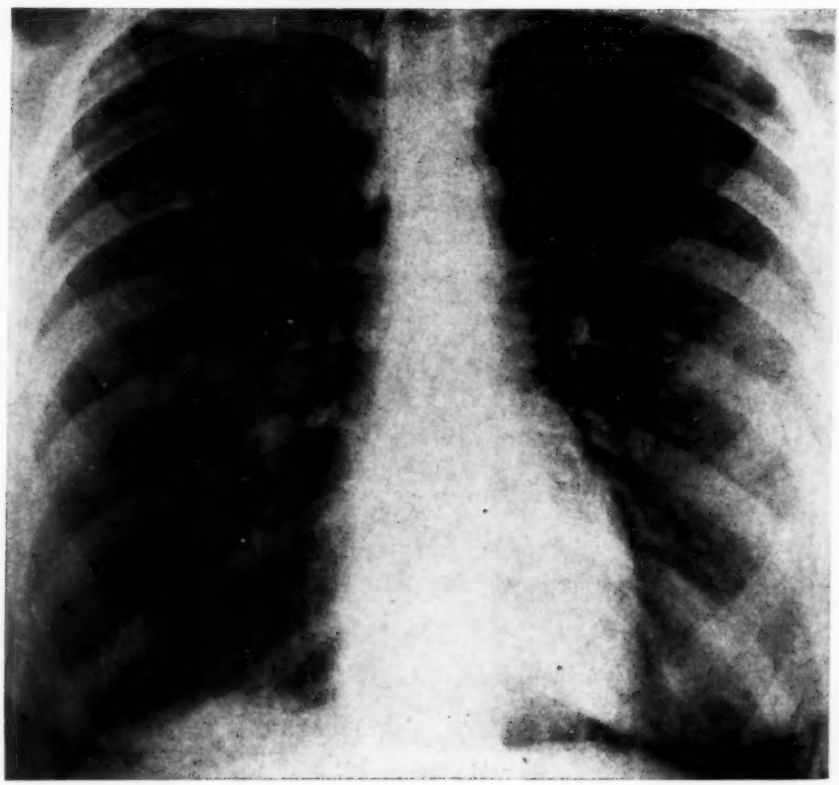


FIGURE IV.

Case V. Skiagram, January, 1931, showing clearing of lung fields with some persistence of reticulation in the lower lobes, especially on the left side.

ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR C. G. LAMBIE.

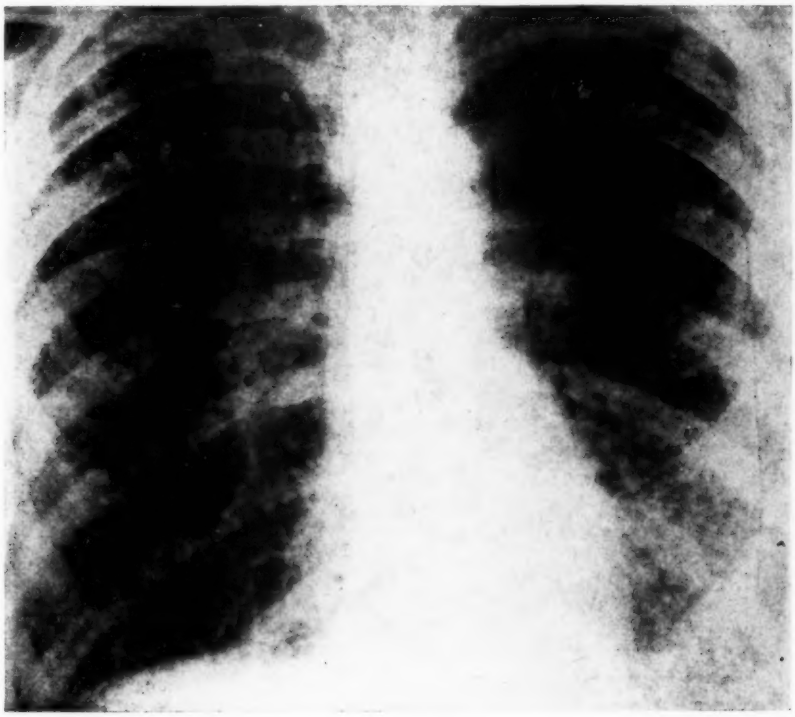


FIGURE V.

Case V. Skiagram, April, 1931. Return of miliary lesions during pregnancy.

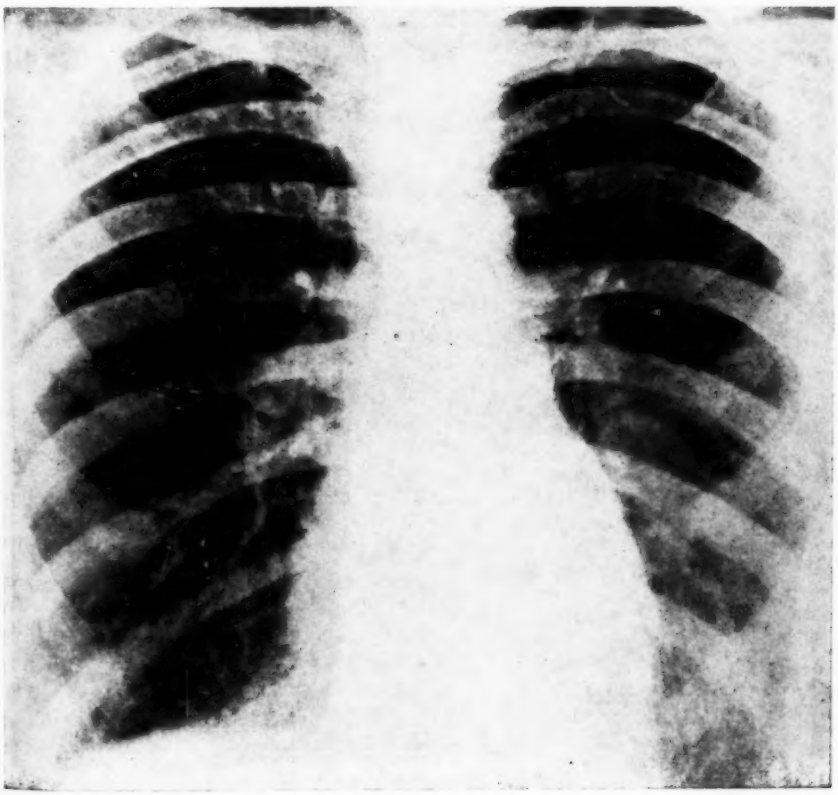


FIGURE VI.

Case V, December, 1936, showing second clearing of lung fields, especially in the upper lobes and on the right side. Persistence of changes at the base of the left lung and of hilar shadows.

ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR C. G. LAMBIE.

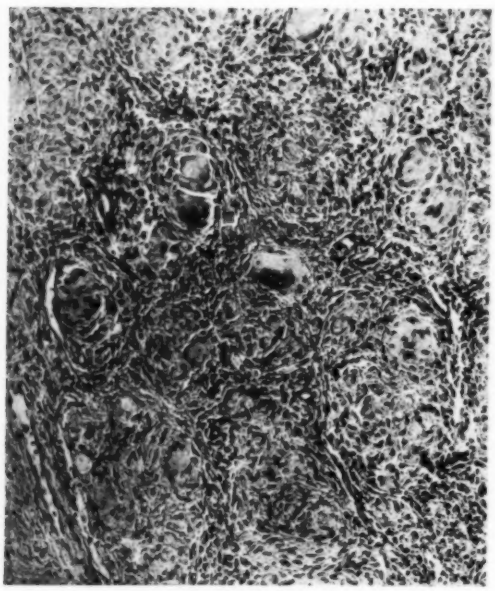


FIGURE VII.

Section of lymph node (Case 1), showing epithelioid nodules and giant cells in all stages of formation. Note the concentric arrangement of the epithelioid cells, the absence of caseation and the absence of surrounding vascular and cellular reaction. In some of the giant cells the nuclei are situated centrally, in others peripherally.

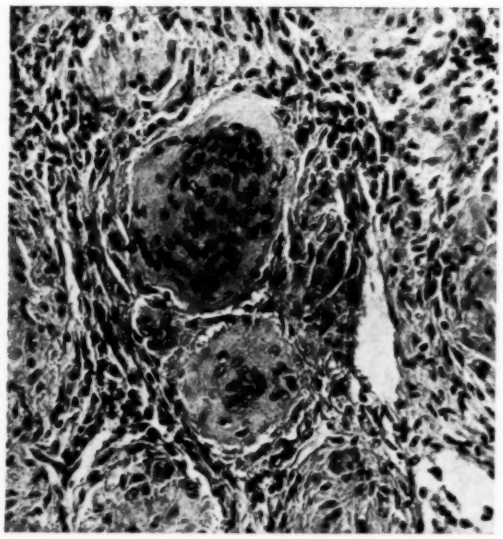


FIGURE VIII.

Giant cells, showing large number of nuclei situated centrally.

ILLUSTRATION TO THE ARTICLE BY DR. T. E. LOWE.

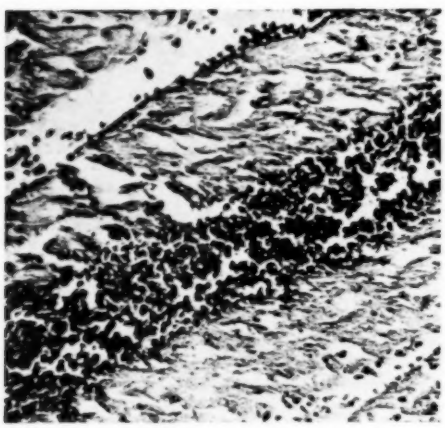


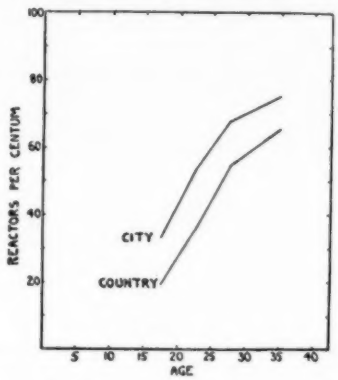
FIGURE III.

High-power photomicrograph of the heart muscle, showing the masses of blood cells lying between the muscle planes.

STUDIES IN TUBERCULOSIS. IV: THE INCIDENCE OF TUBERCULOSIS INFECTION IN COUNTRY PEOPLE IN NEW SOUTH WALES COMPARED WITH THAT IN CITY DWELLERS.[1]

By DOUGLAS ANDERSON, M.D., M.R.C.P., F.R.A.C.P.,
Honorary Assistant Physician, Royal North Shore Hospital of Sydney.

IT has been shown in Scandinavia and in the United States of America that the incidence of tuberculosis infection in the population of various cities has been substantially greater than in the population of nearby rural districts. It is therefore of interest to record the reactions to the intracutaneous tuberculin test of 369 country people in New South Wales, who were over the age of fifteen years and who had lived for less than three years of their lives in closely settled areas, and to compare them with those of a large number of city dwellers who had lived for more than eleven years in the city. This comparison is effected in the table, which demonstrates that the incidence of tuberculosis infection is much less in New South Wales country districts than in Sydney and commonly occurs later in life.



Perhaps this small study will stimulate medical men in country centres to make tuberculin surveys. From such surveys it is likely that information of much interest and value would be forthcoming.

[1] The third article in this series, entitled "Tuberculosis Infection in Medical Students with Special Reference to Incidence in the University of Sydney", is published in *The Sydney University Medical Journal*, June, 1940.

Reactions to the Intracutaneous Tuberculin Test of 369 Country People and of 2,679 City Dwellers.

Ages.	Country People.			City Dwellers.		
	Number Tested.	Number of Reactors.	Reactors *per centum.*	Number Tested.	Number of Reactors.	Reactors *per centum.*
15 to 19 ..	140	27	19·3	834	283	33·9
20 to 24 ..	170	60	35·3	944	506	53·6
25 to 29 ..	33	18	54·5	436	394	67·4
30	26	17	65·4	465	360	75·3
Totals ..	369			2,679		

Reports of Cases.

CHOREA GRAVIS IN PREGNANCY.

By HAMILTON PATTERSON, M.B. (Edinburgh),
Brisbane.

MISS J.H., aged twenty-two years, was admitted to the Brisbane Women's Hospital on April 1, 1940, suffering from severe chorea. Dr. J. W. Ralston, who sent her from the Salvation Army Mothers' Hospital, stated that her condition had grown much worse during the previous week, and bromides and morphine had had no effect on the movements. The patient was stated to have had rheumatic fever five years previously.

Examination.

The patient was a very thin girl. Movements of the whole body were so violent that the patient had to be placed on a mattress on the floor until a suitable bed could be obtained. Speech and deglutition were affected and the patient not only was non-cooperative, but did not appear to be fully conscious. No heart lesion was apparent. The pulse rate was 90 per minute. The temperature was normal and the urine clear. The uterus was enlarged to the size of a 34 weeks' pregnancy. The patient's general condition definitely warranted her being placed on the "dangerously ill" list.

Treatment and Progress.

The patient was placed on a padded bed with side-rails, and isolated. "Luminal" was tried without effect. A hypodermic injection of "Hyoscine co. A" ($^1/_6$ grain of morphine, $^1/_{100}$ grain of hyoscine, $^1/_{150}$ grain of atropine) was then resorted to and enabled the patient to have some sleep.

"Luminal" was persisted with during the following day; but symptoms were in no way abated. In the evening the patient was seen by Dr. Clive Sippe, visiting physician to the Brisbane General Hospital, who suggested "Sodium Amytal" therapy, the dose being regulated by the resultant effect.

Two capsules of "Sodium Amytal" (six grains) were given immediately and procured about one and three-quarter hours' sleep. One more capsule was given and procured another hour's rest. Thereafter the capsules were given at the rate of one capsule every few hours, movements being thereby controlled. In view, however, of the patient's still having six weeks before she was due to be confined, Dr. Bruce Mayes, visiting obstetrician, agreed that surgical induction was indicated. This was done on the second day after admission of the patient to hospital, and the pregnancy terminated twenty-three hours later. The infant was four pounds seven and a half ounces in weight, was very cyanosed, and died fourteen hours later.

It was decided to continue "Sodium Amytal" therapy for the mother as long as it seemed necessary. Improve-

ment, however, was instantaneous. The choreic movements had practically ceased the day after the termination of the pregnancy. The patient took semi-solid food well and appeared to understand questions addressed to her. However, she was unable to speak.

Three days later the patient was speaking rationally and could take a glass of water in her hand and drink it without spilling it. The finger-nose test could now be performed without difficulty, and tests of the central nervous system revealed no abnormality.

Five days after the pregnancy had terminated, the writer, on entering the ward, was agreeably surprised to see the patient sitting propped up in bed reading "True Romance".

Commentary.

A severe case of chorea induced by the worry and shame of pregnancy in a single girl is reported.

"Sodium Amytal" appeared to have a definitely beneficial effect in this condition, in which bromides and morphine had failed. No real improvement, however, took place till the pregnancy was artificially terminated, after which the resultant improvement was really dramatic.

An interesting point about this case was the absence of a demonstrable heart lesion and the absence of tachycardia, even when the disease was at its height.

Acknowledgement.

I have to thank Professor G. Shedden Adam, Medical Superintendent of the Brisbane Women's Hospital, for permission to publish this case.

UTERINE HYPOPLASIA TREATED WITH FOLLICULAR OVARIAN HORMONE.

By T. H. SMALL,
Sydney.

MRS. C.W., aged twenty-four years, had been married for twenty-one months and had failed to conceive. Menstruation had commenced at the age of fourteen years and had been irregular, lasting seven days and occurring every five or six weeks. There had been a complete absence of libido and sex response; dysmenorrhœa was intense for the first two days and it always caused her to go to bed. The menstrual loss was described as fairly heavy. She had been subjected to dilatation for sterility and dysmenorrhœa six months before without relief, and had been told that she had an infantile womb and would never become pregnant.

Examination revealed a very small uterus of cochleate type, and a vaginal septum extending from the introitus to the cervix; the right portion of the vagina admitted a finger-tip only, the left being the functioning part. Later the cervix could be seen and felt under anæsthesia from each portion. The uterus was about half normal size.

A course of intramuscular injections of follicular ovarian hormone was commenced on November 30, 1937, a few days after menstruation had ceased; the dose was 50,000 international units every five days for five doses in each intermenstrual interval. The menstrual periods in December and January were absolutely painless, and examination at the end of January revealed a slight but definite increase in size of the uterus. In April, after the fourth course of treatment, the uterus had greatly increased in length and thickness and was then about three-quarter normal size. Two more courses were given, and the size of the uterus was then about normal. After the cessation of treatment dysmenorrhœa returned, so a dilatation was performed with great difficulty to the size of a number 6 Hegar's sound, and a laminaria tent was inserted into the canal to promote further dilatation and was left for forty-eight hours. The cervical tissue was extremely tough, and this was the slowest and most difficult dilatation I have ever carried out. The uterus measured on the sound three and a half inches. Menstruation the next day was very painful and the removal of the tent was most difficult. Dysmenorrhœa remained, and no change in libido or sex response occurred during or after treatment and the dilatation.

In February, 1939, the patient presented herself again; she was two months pregnant. The last menstrual period had occurred in December, one year after the commencement of treatment, and the patient had conceived six months after the cessation of injections. The confinement took place at term, but she had albuminuria for the last two months of pregnancy. The septum was badly bruised during a forceps delivery and was clamped, cut and oversewn.

A total dose of 1,500,000 international benzoate units was given over a period of six months. Each dose was put up in oily solution in an ampoule of one cubic centimetre, containing 50,000 international benzoate units, equivalent to five milligrammes of œstradiol benzoate, which is the benzoic acid ester of dihydroxy-œstrin.

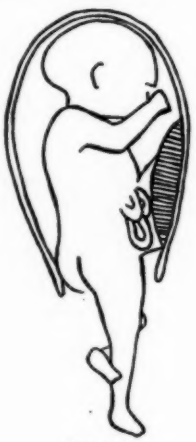
ABNORMAL ATTACHMENT OF THE FŒTUS TO THE PLACENTA.

By JOHN S. GREEN, M.D. (Melbourne), D.G.O. (Dublin), F.R.C.O.G., F.R.A.C.S.,
Out-Patient Gynæcologist, Women's Hospital, Melbourne; Thalia Roche Lecturer on Obstetrics, University of Melbourne.

THE article by Dr. Isadore Brodsky in THE MEDICAL JOURNAL OF AUSTRALIA of December 30, 1939, has reminded me of two cases in which the fœtus was somewhat similar to his Specimen II, and I thought a brief note on the clinical course of these cases might be of interest.

Case I.

The patient was undergoing her second confinement; the fœtus was barely viable. The baby was presenting by the feet and unexpected difficulty was experienced in the delivery. On introduction of the hand a sac containing loops of bowel was felt and the baby could be delivered only by manual removal of the placenta at the same time as the extraction of the baby. The ventral abdominal wall of the child was largely represented by the combined thin-walled sac and placenta. About two years later this patient was delivered of a healthy baby girl.



CASE I.

CASE II.

Case II.

The patient was pregnant for the sixth time and the fœtus was about full term. This patient was seen at an emergency consultation about midnight. There was brisk vaginal hæmorrhage and the placenta was felt covering

an os which was only slightly dilated. An immediate classical Cæsarean section was performed and the child proved to be a monster, which did not survive for long. The child was in an attitude of extension, with the legs towards the back. The back itself was shortened. The ventral and caudal aspect of the baby was replaced by placenta. An anus was present, but the external genital region seemed to merge with the lower end of the placenta.

It would probably have been possible to detect this abnormality radiologically prior to operation, but the operation was an emergency one. Actually, on reviewing the case afterwards, I felt rather relieved that my diagnosis had been incomplete; the horns of the dilemma would have been rather sharp. This patient very recently had a normal baby by another Cæsarean section.

I very much regret that it is not possible to give any really adequate pathological description of these cases.

Reviews.

THE WHITE MAN IN THE TROPICS.

THERE has long been wanted an unbiased account and assessment of white settlement in the tropics, not of one country but in as wide a range of conditions as possible. This is now available in Grenfell Price's "White Settlers in the Tropics" which has been brought out as a "Special Publication" of the American Geographical Society.[1] It is a fascinating book to read, dealing as it does with historical, economic, social, medical, administrative, climatic, geographical and geological conditions in the tropics of Australia, America and Africa. The author quotes widely from many sources and always with discrimination and judgement. Dr. Price, a South Australian, has himself studied conditions in the tropics of Australia, Panama, Costa Rica, the West Indies and the United States of America, with a broad background of other men's work and conclusions.

An absorbingly interesting historical account of the settlement of each region dealt with is given which by itself would make the book worth reading. The impact of the white man on the native population and of the natives on the white settler is discussed with much feeling. Where there has been failure, the causes of the failure are considered in some detail. The medical aspects are dealt with as fully as can be by a layman and with great fairness. Omissions there are, some of them important, but in a book of 300 pages covering such a wide range this must be expected.

The sections on the various parts of the Australian tropics are very well done and could be read with great advantage by our politicians and others.

In the first half of the book are considered the nature and history of the problem of white settlement in the tropics and regional studies.

In the second half of the book some of the factors governing white settlement in the tropics are considered in more detail under the headings "Racial Problems", "Some Environmental Factors", "Acclimatization and Health", "Diet", "Clothing", "Exercise", "Administrative and Economic Problems". There is finally an excellent summing up of the evidence available.

One of the conclusions seems, on the face of the evidence offered, to be inevitable that where there is a large native population, there will be a merging of white and coloured people. The author considers that conditions in northern Queensland are more hopeful than in other tropical regions, but he is by no means certain. As he states: "The scientific world has at last glimpsed the vastness and complexity of the problem. In the hands of scientific workers lies the solution." There are notes on the text and scientific appendices by Robert Stone, of the Blue Hill Meteorological Observatory of Harvard University, which, while replete with important scientific details, are perhaps the least satisfactory parts of the book for one who has worked on physiological problems in the tropics themselves rather than in laboratories outside the tropics.

The book can be recommended with every confidence to anyone interested in the struggles in settlement by man.

[1] "White Settlers in the Tropics", by A. G. Price, with additional notes by R. G. Stone; 1939. New York: American Geographical Society. Super royal 8vo, pp. 324, with illustrations. Price: $4.00 net.

PHYSICAL THERAPY.

MEDICAL practitioners and others wishing to engage in the study of physical therapy are often deterred by the absence of suitable text-books devoted to the various portions of the subject. Consequently the advent of a well-written and clearly illustrated manual, such as William Beaumont's book on diathermy, short-wave therapy *et cetera*, should be welcomed by a great many members of the profession.[1]

In his book, the author has successfully endeavoured to present a brief but accurate account of the fundamental principles underlying the generation and application of the oscillating or high-frequency current. The greater portion of the volume consists of a description of the principles and practice of diathermy. Reference to these chapters will enable the practitioner to secure the best results possible from this form of electrotherapy. Although most observers are of the opinion that diathermy will be eventually replaced by short wave therapy, there are still, of course, many diathermy generators in existence, and it is to the operators of these machines that the instructions should be particularly valuable. If, on the other hand, the reader is not engaged in the active practice of diathermy, but wishes to equip himself for the successful study of the more powerful and effective short-wave therapy, he will find that this section is very useful to him as a preliminary to the understanding of the properties of the short-wave current.

After this comes a chapter on epithermy, a process which from a clinical viewpoint is decidedly less important than are the diathermic methods of treatment. The fact is rightly and sufficiently emphasized by the author in his preliminary observations concerning this more or less superficial application, whose effects are, to some extent, psychological. Although the uses of epithermic apparatus by the medical profession are not very great, a lucid description of epithermy is always interesting, even to those who are convinced that the process is only of academic value, and that its greatest usefulness is based upon the fact that it represents a stage in the evolution of the particular type of current which has made short-wave therapy possible. As a result of its historical significance, if for no other reason, the section should be appreciated by a large number of readers.

The concluding chapters refer to the basic electrical and physical principles underlying the construction of many of the better-known generators used in short-wave therapy. Brief reference is also made to the physiological effects and clinical indications of the short wave. This part of the book would almost certainly be of greater practical value if the conditions responding to treatment by this method were more fully described, even if the elaboration entailed some reduction in the details regarding circuits and machines. Doubtless, the author feels that, at the present time, results do not justify the adoption of a dogmatic attitude concerning some of the responsive diseases, but it is to be hoped that, perhaps in future editions, the suggestion may be utilized.

[1] "Diathermy, Short Wave Therapy, Inductothermy, Epithermy", by W. Beaumont, M.R.C.S., L.R.C.P.; 1939. London: H. K. Lewis and Company Limited. Crown 8vo, pp. 312, with 106 illustrations. Price: 10s. 6d. net.

A glossary of technical terms is appended. Here, some of the more complex electrical and physical conceptions are explained accurately and in the efficient manner that characterizes the earlier sections, and that enables the reader to appreciate the fact that the book will form a very valuable contribution to this branch of medical science.

ELECTROCARDIOGRAPHIC PATTERNS.

IT may be stated at once that Dr. Barnes, who is an acknowledged pioneer in electrocardiography in the United States of America and of the staff of the Mayo Clinic, Rochester, has produced a notable and valuable addition to the large series of monographs already in existence which concern themselves with electrocardiographic interpretation.[1] This work is based upon an amplification of certain characteristic recurring patterns in the electrocardiogram as opposed to over-emphasis upon single abnormalities, which if considered alone may lead to serious error. It is not a book for the beginner in this specialty, although the broad views it embodies should be reiterated at the conclusion of every elementary course in electrocardiography. The author's final paragraph is worthy of reproduction. "Intelligently used", he writes, "the electrocardiogram will elucidate as well as raise questions of normal and pathologic cardiac processes. Progress in its understanding will depend on sound clinical reasoning, on thorough knowledge of the anatomy and physiology of the heart, and last but not least, on a competent conception of the pathology of heart disease. Like every other laboratory adjunct to diagnosis, the value of electrocardiography will be proportional to the individual's knowledge in the fundamental fields just named."

Accordingly, the monograph commences with a brief description of the usual distribution and variations of the coronary circulation. With Whitten, Barnes was one of the first to correlate the "Q_1T_1" and "Q_3T_3" electrocardiographic patterns with acute myocardial infarction of the anterior and posterior apical regions respectively. This section is amply illustrated by actual photographs of "cleared" hearts. The next chapter is concerned with the actual patterns which render acute and subacute myocardial infarction recognizable, in spite of irrelevant distorting factors. This and all the subsequent sections are profusely illustrated by diagrammatic reproductions of serial tracings, accompanied by epitomized case histories. There is considerable repetition, and occasional summaries help to drive home the main principles of the author's views; these are welcome features to the student of electrocardiographic literature.

The next two chapters deal with appearances found in left and right predominant ventricular strain, patterns which are insufficiently recognized in this country. The transitory character of acute *cor pulmonale* following pulmonary infarction and the appearances in acute pericarditis demand more frequent serial cardiography than is usually undertaken; but this is essential if the presence of these important complications is to be suspected.

The two final sections include an excellent summary of the effects of certain drugs, metabolic disorders and infections on the electrocardiogram, and finally observations relative to precordial leads. The Wolferth lead IV appears in all the ninety odd illustrations, simply because the experience and tracings which have made the book so useful were obtained before the general change to lead IV F or R took place two years ago. With Dr. Deeds, the author has investigated two series of normal persons by all the accepted methods, about twelve in all, of securing a fourth lead, and valuable tables are published of the minimum and maximum values of each deflection allowable in a normal curve. The author himself prefers leads IV R or IV F, and leads CR_2 or CF_2 for routine use. The latter aid in the differentiation of unilateral ventricular strain. If in doubt, he takes a complete series of chest leads. The statement is often made that precordial leads are chiefly of value in the diagnosis of myocardial infarction. This over-simplifies the matter, and minimizes the rôle that bad skin contact, inaccurate placement of the exploring electrode and other cardiac disorders may play in modifying the precordial leads.

Barnes insists that in nearly every case familiarity with all the accepted abnormal patterns in the standard leads will remove from the cardiologist the undue responsibility of making a final decision by the fourth lead alone, and will act as an indispensable check upon its interpretation. In other words, the fourth lead and standard leads have complementary and supplementary values, but they must be studied collectively as a single complete pattern.

This monograph is well written, excellently illustrated and handsomely bound. It should be read by every cardiologist who is looking for a well-balanced summary of the finer details of the electrocardiogram by a highly qualified authority.

[1] "Electrocardiographic Patterns: Their Diagnostic and Clinical Significance", by A. R. Barnes, M.D.; 1939. Baltimore: C. C. Thomas. Royal 8vo, pp. 197, with illustrations. Price: $5.00 net.

ABDOMINAL INJURIES IN WARFARE.

"THE ABDOMINAL INJURIES OF WARFARE", by G. Gordon-Taylor, is a little book of 87 pages, deriving from two lectures delivered at the British Postgraduate Medical School, London, in March, 1939,[1] and dedicated by the author "to my colleagues the Casualty Clearing Station surgeons of the Franco-British Western Front, 1914-1918". Although in the preface the statement appears that the text purports "to be little more than a companion-guide to these illustrations", Gordon-Taylor contrives to epitomize therein the great experience gained by him during that war. No one is better qualified than he to speak with authority and no surgeon about to meet for the first time the problems dealt with in this book can fail to benefit from its perusal.

In an introductory chapter the interesting fact emerges that while the incidence of abdominal wounds among those reaching advanced surgical units in the Great War was 2% to 3%, more than 9% of the casualties in the Spanish civil war were of this type. The increase is ascribed to the intensive aerial bombing employed, and in particular to the use of "liquid air" bombs. This chapter deals with such general problems as shock, anæsthesia in its different forms, radiography and operative technique. Under this last heading the author discusses the question of the type of incision to be employed, and later he returns to this important subject in dealing with abdomino-thoracic wounds and the approach thereto. Civil surgery has little to offer upon which to build up experience of problems of this kind, and the principles enunciated are most helpful to those likely to enter this field of surgery, in which a sound judgement as to the best operative route may largely determine the issue.

Penetrating wounds of the hollow and of the solid viscera are discussed in the succeeding chapters which are followed by those upon their non-penetrating injuries. Here the practitioner of civil surgery finds himself upon more familiar ground and he will welcome the apothegm that "the most urgent of all indications for laparotomy . . . is doubt".

Much of the experience gained in the last great war has become incorporated and fixed in modern surgical practice. It would be tragic if any of the other surgical lessons gained therein were to be lost to the present generation of casualty clearing station surgeons. A great deal of most valuable teaching, from the pen of high authority, is here rendered available to these men.

[1] "The Abdominal Injuries of Warfare", by G. Gordon-Taylor, O.B.E., M.A., F.R.C.S., F.R.A.C.S.; 1939. Bristol: John Wright and Sons Limited. Medium 8vo, pp. 86, with illustrations. Price: 10s. 6d. net.

The Medical Journal of Australia

SATURDAY, JUNE 15, 1940.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

"COVERING": A WARNING.

MOST people will agree that, in virtue of his professional knowledge, a renegade medical practitioner has greater opportunities for villainy than almost any other member of the community. Few, therefore, will question the necessity for a rigid code of medical ethics. But gross lapses are not the only ones that are likely to be fraught with grave consequences to the public; minor deviations from the standard have far-reaching effects. For this reason, if for no other, the standard must be maintained. The standard of ethical conduct subscribed to by all medical practitioners is contained in the clauses of the Hippocratic oath; it is the standard which is, or should be, enforced by every statutory body controlling medical practice. In view of the general confusion that exists in the minds of many of the laity, the difference between medical ethics and medical etiquette should be once more stated: etiquette deals with manners, especially as between one practitioner and another; ethics deals with morals. Breaches of medical ethics are more than exhibitions of bad form or departures from accepted custom. Robert Saundby, whose classical work on medical ethics should be in the hands of every practitioner, stated three principles which might be regarded as the cornerstones of medical ethics. He summed up the relationship of a medical practitioner to his colleagues in the words of what is known as the golden rule: "Whatsoever ye would that men should do to you, do ye even so to them." In his relations to his patients their interests should be his highest consideration—*"Aegroti salus suprema lex"*. In his relation to the State, to the laws of his country and his civic duties, Saundby thinks that there is no better guiding principle than the words: "Render, therefore, unto Caesar the things that be Caesar's"; in other words: Obey all lawful authority.

The State, having set up certain standards of knowledge and ability, to be evidenced by the possession of approved university degrees or college diplomas, admits a medical graduate to registration if he has the necessary qualification. He then is granted all the privileges and assumes all the responsibilities of a legally qualified medical practitioner. If he abuses the privileges or shirks his responsibilities he will be guilty of a breach of ethics and may have his registration cancelled. These measures are everywhere regarded as being essential to the public welfare. Whatever latitude is allowed to unqualified persons to exploit the faith of a gullible public (and we know that in some Australian States this latitude is considerable), the State is righteously indignant and shows its resentment in no half-measures to any unqualified person who poses as a legally qualified practitioner. The State expects those to whom it grants registration to help it to maintain this attitude. For example, the General Medical Council in Great Britain takes a most severe view of the employment by a practitioner of an unqualified assistant; it has set its face just as sternly against what is known as "covering". This is defined by Saundby as "countenancing and assisting any unqualified person to attend or to treat patients either by granting certificates of death or otherwise". Charges of "covering" would not, of course,

apply to the training and instruction of medical students as pupils or to the legitimate employment of dressers, midwives, dispensers, surgery attendants or technicians under the immediate personal supervision of registered medical practitioners. The regulations of the General Medical Council dealing with this matter are as follows:

Whereas it has from time to time been made to appear to the General Medical Council, that some registered practitioners have been in the habit of employing, as assistants in connection with their professional practice, persons who are not duly qualified or registered under the Medical Acts, and have knowingly allowed such unqualified persons to attend or treat patients in respect of matters requiring professional discretion or skill; and whereas in the opinion of the Council such a substitution of the services of an unqualified person for those of a registered medical practitioner is in its nature fraudulent and dangerous to the public health:—The Council hereby gives notice that any registered medical practitioner, who is proved to have so employed an unqualified assistant, is liable to be judged as guilty of "infamous conduct in a professional respect" and to have his name erased from the Medical Register under the 29th Section of the Medical Act, 1858.

Further in regard to the practice commonly known as "covering", the Council gives notice that any registered medical practitioner, who by his presence, countenance, advice, assistance, or co-operation, knowingly enables an unqualified or unregistered person (whether described as an assistant or otherwise) to attend or treat any patient, to procure or issue any medical certificate or certificate of death, or otherwise to engage in medical practice as if the said person were duly qualified and registered, is liable to be judged as guilty of "infamous conduct in a professional respect", and to have his name erased from the Medical Register under the said enactment.

It is interesting to note that Saundby describes as a case of "covering" one in which a radiographer complained that an appointment made with him was cancelled and the patient was sent by a medical practitioner to a lay radiographer. Finally, medical practitioners should know that the General Medical Council has issued a special warning to medical practitioners against cooperation with an unregistered dentist by the giving of an anæsthetic or by other means.

Any sensible person giving a little thought to this whole question will immediately say that the shortest and the surest way of securing the public welfare is to prevent unqualified persons from practising; this would probably remove most of the temptation to such irregularities as "covering". But the law makers have other ideas, and while they prefer that the public shall be free to face the danger of unqualified practice, they hope perhaps that it will know where to draw the line. The medical profession must be constant in its endeavour to maintain a high ethical standard in practice and it must be scrupulous in its obedience to the law relating to unqualified persons. At the present time there are in Australia unregistered and unqualified persons who undertake the treatment of patients and who look for registered practitioners to give some of their treatment for them. These practitioners should understand that they are laying themselves open to very serious charges if they undertake this kind of collaboration. We may be quite certain that the medical boards of the Australian States would take the same serious view of "covering" as is taken by the General Medical Council in Great Britain.

Current Comment.

THE MALE CASTRATE.

ENDOCRINOLOGY is undoubtedly one of the most interesting subjects for research, despite the fact that results often increase rather than diminish confusion. The clinical report, "Study of a Male Castrate", by Feinier and Rothman, is not a piece of pure research, but is the presentation of details concerning one patient who had been subjected to double orchidectomy, thirty years previously, for tuberculosis of the testes and epididymes.[1] He was over fifty years of age at the time of the report, and had consulted his doctor for bitemporal headaches, which had commenced soon after his operation.

The main characteristics of the patient were such as would be expected according to customary teaching. He had many features of female type: sparse hair, which was female in distribution in the region of the pubis, and an increase in subcutaneous fat in the pectoral, abdominal and hip areas. The voice was soft and gentle, the manner courteous. The basal metabolic rate varied from −13% to −20%. The sugar tolerance was increased. The urine contained no androgenic material; but the blood examination revealed the spasmodic presence of gonadotropic hormones. In contradiction of these features, the libido and potency were, if anything, enhanced, especially soon after the orchidectomy.

[1] *The Journal of the American Medical Association*, December 9, 1939.

It is in the application of endocrinological research to man that most of the confusion is found. One would expect the male castrate to be both sterile and impotent, although why this should be so is made uncertain from our experience with the castrated female, in whom impotence is by no means universal. It is notable also that potency sometimes persists in the ox and the gelding. The case described by Feinier and Rothman is but one of many. Lange has shown that potency may be retained by quite a large proportion of male castrates. Amongst his subjects, who were military patients of the last war, the majority suffered a gradual decline in their powers. In Berlin the experience of castration for sexual offenders has been gratifying; no repetition of abnormal conduct has occurred. The consideration of this aspect is of importance. It would appear that this method of dealing with such perverts is successful for psychological reasons and not necessarily because libido and potency have been lost. Erroneous conclusions can be readily drawn, however, from the study of the results of only one or two writers. All medical men have not had the same experience as those already quoted. McCullagh and Renshaw reported impotency in nine out of twelve male castrates. Reports from Berne and Denmark show a similar result in an even greater proportion of cases. The age at which the orchidectomy is performed is important. Impotency is far more likely to result if castration is carried out early. The consideration of castration before puberty is omitted here, since it opens up a much wider field for discussion.

The tantalizing thought is: what tissue is responsible for the production of the substance most concerned in the maintenance of potency in the castrate? It is generally accepted that gonadotropic hormones from the anterior lobe of the pituitary can act only on the gonads and produce their effect through them. Castration is usually followed by increase in the gonadotropic activity of the anterior lobe of the pituitary. It must be assumed, then, that libido is not controlled by the testis itself, but by psychic centres alone or in conjunction with some obscure pituitary control. When this is lost after castration, the mechanism is probably psychological rather than due to an hormonal deficiency.

THE CHOICE OF A STETHOSCOPE.

AFTER his two eyes and his two hands his stethoscope is the doctor's most trusty instrument of diagnosis and is so inseparable from his daily round as to have become almost the badge of his profession. Often the doctor feels a sentimental attachment to his own stethoscope; usually he thinks he can hear with it better than he can with somebody else's. He may have bought it long ago when he was a student, observed its more handsome qualities as it lay with the others on the shelf in the shop, and felt very knowing as the shopman praised his choice. Always he is satisfied with it. Should its ear-pieces or bell become cracked he feels a pang in himself and lovingly binds the wound with adhesive strapping. The binaural stethoscope is the stethoscope of today for general medical practice, and since there are so many kinds and patterns in use, it might be imagined that as acoustic instruments there was little to choose between them. One may pardon the confusion of the student when he sees one eminent physician using a stethoscope with a flat chest-piece and a diaphragm, while another condemns this because it does not transmit well the lowest pitched sounds, and a third, an impressive junior, flaunts a brand-new American instrument with a whole boxful of interchangeable chest-pieces.

Recently F. D. Johnston and E. M. Kline[1] have carried out an acoustical study of the binaural stethoscope and have made tests of many patterns in order to determine which, if any, best transmitted sounds from the chest to the ear. They appear to be the first to have dispensed entirely with human judgement in such experiments and to have made use of modern electrical equipment. The source of the sounds used in their experiments was a special telephone receiver driven by a variable frequency oscillator, placed within the heart of a cadaver. The chest-piece of an arbitrarily selected stethoscope, intended to be a standard for comparison, was held firmly against a certain point in the precordial region, and the sound waves, of various frequencies, from 20 to 800 cycles per second, were transmitted through the columns of air in the stethoscope to a condenser microphone, whence they passed to an amplifier and thence to an output meter. Then, by substitution of various different chest-pieces or tubes for those of the standard stethoscope and by the recording of the logarithms of the readings of the output meter, a measure was obtained of the loudness of the sounds transmitted, and thus the efficiency of the various kinds of stethoscope could be compared with the standard.

Johnston and Kline conclude from their experiments that chest-pieces of the bell type should have, for the greatest efficiency, as shallow a chamber as practicable, although for use on the chest wall a depth of not less than three to five millimetres is probably necessary. They also found that the rubber nipple often placed over the chest-piece to make it more agreeable to the patient (although it is less easily cleansed) and to reduce interference due to adventitious sounds also increases the efficiency of the stethoscope. Of the Bowles type of chest-piece they state that the diaphragm acts as a filter to suppress low-pitched sounds, but that the diaphragm must be stiff to be effective in this respect. With regard to the tubing of the stethoscope, the authors

[1] *Archives of Internal Medicine*, February, 1940.

have found that although rubber tubings of different lengths, diameters and degrees of stiffness modify the transmission of sound, the differences are relatively small, and the efficiency of a stethoscope depends more on the choice of the chest-piece than on the nature of the tubes. Still, tubes with small air passages conduct sounds of all the frequencies tested somewhat better than tubes of larger diameter.

The authors anticipate and disarm criticism when they point out that in the diagnosis of cardiac disease training and experience are more essential than a perfect stethoscope. Thus they do not advise physicians to discard the stethoscope to which they may be accustomed for one that may be acoustically superior, because, they state, except for sounds that are so faint as to be nearly inaudible, the loudness of sounds through the instrument is of no importance. Nevertheless, their findings will doubtless soon be reflected in a greater demand for stethoscopes with shallow bells and narrow tubes.

EXPECTORANTS.

IN the formulary which every medical man keeps at the back of his mind there is usually a favourite expectorant mixture or "Mist. expect.", which frequently finds its way to the tip of his pen. It may contain any of a great variety of ingredients; usually it contains a little potassium iodide, some compound of ammonium, ipecacuanha or senega or quillaia or squills in some form, and nearly always some paregoric to soothe the patient's cough. Most practitioners retain sufficient skill in prescribing to vary the prescription somewhat to suit different patients' symptoms; some indeed delight in building an elegant mixture around guaiacol carbonate or terpin hydrate, even in these days of much advertised and easily prescribed proprietary expectorants, entirely "ethical", with simple names like "Lysotussin" and "Cynobex". However, there can be little doubt that the use of the most of the expectorant drugs today is based on tradition rather than on the prescribers' knowledge of their mode of action. Most of the information concerning them in the text-books of pharmacology would seem to have been copied from edition to edition since the last century, and, if this information is to be believed, it may well be that some of the expectorant drugs are not entirely suitable for the purposes for which they are commonly prescribed.

An expectorant is a drug which aids the expulsion of the liquid contents of the bronchial tubes, although the definition is often varied by the research workers, whose experiments to show the value of some new proprietary remedy appear from time to time in the scientific Press. Expectorants are classified pharmacologically as reflex expectorants, such as ammonium carbonate, antimony compounds, squills and senega, which act by irritating the stomach and thus stimulating the vomiting and bronchosecretory centre; central expectorants, such as apomorphine and ipecacuanha, which directly stimulate the bronchosecretory centre; excitatory secretogogue expectorants, such as pilocarpine, which act at the secretory nerve endings; and local secretogogue expectorants, such as iodides and ammonium chloride, which are excreted by the bronchial glands and there, it is believed, effect a local stimulus to secretion. Indirect effects of drugs on the bronchial secretion by means of their effects on the ciliary movements and pulmonary ventilation have been studied, but are not of great importance.

Some of the curious methods which have been used in the past to study the bronchial secretions are mentioned by W. F. Connell and his collaborators, who have recently made experiments to test the value as expectorants of glycerol guaiacolate and of various other guaiacols.[1] Some workers have observed the production of mucus in the exposed trachea; others have "collected secretions in a calcium chloride tube from the trachea of an anæsthetized cat held upside down"; while others again have compared the weight of the lungs with that of the liver in their animals after the administration to some of them of an expectorant drug. Connell and his collaborators have made their experiments with albino rats, quickly killing them at certain intervals after administering the drugs and measuring the water content of three parts of the respiratory tract, namely, the trachea, the "proximal part of the lung containing most of the bronchial tissue", and the "distal part of the lung containing mostly alveolar tissue". They found that guaiacol, guaiacol carbonate and glycerol guaiacolate all produced a considerable increase in the "lung water". At first the principal effect seemed to be an increase of tracheal moisture, but later and for some days the total "lung water" was increased, showing that the drug stimulates the production of pulmonary secretions, "which are removed as quickly as produced".

One conclusion drawn from these experiments is that guaiacol and the derivatives mentioned effectively aid expectoration. Nevertheless, the propriety in the presence of inflammatory disease of the respiratory tract of administering drugs which aid expectoration by increasing the "lung water" is at least open to question. In the presence of tracheobronchitis with dry hacking cough the guaiacol drugs would doubtless do good. We are assured that they do not inflame the trachea or alter its histological appearance, while, for the first few days of their administration at least, they ameliorate cough. But it is reasonable to suggest that they might be useless or even harmful in the presence of capillary bronchitis or bronchopneumonia, or of emphysema or asthma, or indeed of any condition in which the lungs were already congested or the heart was embarrassed.

The older clinicians divided the expectorant drugs into two classes, the depressing expectorants,

[1] *The Canadian Medical Association Journal*, March, 1940.

antimony and ipecacuanha, which they prescribed in the early stages of bronchitis to relieve congestion and set up a free secretion, and the stimulating expectorants, such as ammonium carbonate, squills and senega, which were used to render mucopurulent secretions less viscid. The pharmacological basis of this distinction is very obscure. A good deal of medical science is built on a foundation of exploded empiricism; and it seems that the time is ripe to review the pharmacology of many of the expectorant drugs. Meanwhile medical men can ask themselves when prescribing for the patient with a cough whether this or that ingredient of their mixture is quite harmless and also just what they expect of it.

THE STUMP OF THE APPENDIX.

IT has been well said that complacency is an attitude of mind which the surgeon must strive to avoid. Such a mental outlook is most likely to develop when a procedure has become relatively stabilized in technique and satisfactory in results. Most surgeons have settled down to a particular method of performing appendicectomy. Their opinions are usually based on clinical observations, which are of questionable reliability, because, though any one of a variety of methods may have been employed, unfavourable complications rarely develop in straightforward cases. In the operation of appendicectomy the step regarding which there is most divergence of opinion is that of the disposal of the stump. British surgeons almost always invert the stump of the appendix and bury it with a purse-string suture. The neatness of this manœuvre and the satisfactory outcome, in most cases, have tended to induce just that complacency that should be shunned. It is therefore appropriate to ask whether the stump of the appendix when dexterously invaginated is not only out of sight but out of mind, and further, to emphasize that while the end-results of appendicectomy compare favourably with those of most other surgical operations, they still fall short of the ideal. The alternative method of simple ligation of the stump has been used in other countries for many years. Lilienthal in 1903 and de Martel in 1920 strongly advocated simple ligation, and in France this method appears to be adopted almost universally. In the United States of America there are various schools of thought. In 1934 no less an authority than C. W. Mayo wrote:

> There are four reasons why I do not invert the carbolized stump of the appendix: (1) Dr. Robertson of the Section of Pathologic Anatomy at the Clinic has found that invariably, in cases in which appendicectomy with inversion of the stump has been done in combination with some other surgical procedure and death has resulted, there is a pus pocket in the inverted stump up to twenty-one days postoperatively; (2) the cultured suture material used to invert the stump, once having run through the intestinal wall, invariably is infected with pathogenic bacteria; (3) non-inversion shortens the surgical procedure, and (4) I have never had occasion to regret not having inverted the stump.

In the absence of agreement between clinical observers, it is of interest to examine the results of recent experimental research. Here again there is no unanimity, possibly owing in part to anatomical variations in different species of animals used. According to "Cunningham's Text Book of Anatomy" (seventh edition), a vermiform appendix is found only in man, the higher apes and the wombat, although a somewhat similar structure occurs in certain other animals. J. K. Donaldson and H. S. Thatcher have performed a series of experiments on dogs and have concluded that the formation of adhesions is less frequent and less extensive when the stump is buried by a purse-string suture than when the simple "ligation and drop" method is followed.[1] They state that the absorptive power of the peritoneum in the small pocket formed by invagination is adequate to take care of an appendix stump that has been properly ligated and treated. By contrast some detailed investigations by Kross[2] may be quoted. Thirty-nine rabbits were subjected to appendicectomy; in twenty-three the stump was buried, the remaining sixteen being treated by simple ligation. At varying intervals after operation the animals were anæsthetized and the appendix stump was first examined *in situ* and then removed for microscopic study. Kross concludes that ordinary ligation, without inversion, is the simplest, safest and most effective procedure. He found that in the ligated stump the healing process was accompanied by adhesions to the surrounding tissue, but that these were not so well developed as when the stump was buried. Where the stump was invaginated Kross found adhesions to surrounding structures, lymphadenitis, and occasional pericaecal abscess formation. Most striking was the observation that the part of the caecal wall invaginated by the purse-string suture was almost constantly the seat of hæmorrhagic infarction, although no obvious vascular damage or hæmatoma formation had accompanied the insertion of the sutures. The infarcted portions of caecal wall had in many cases undergone ulceration. Yet another plan is urged by A. Ochsner and S. Murray.[3] They condemn both of the methods mentioned above, stating that simple ligation is particularly dangerous and has on several occasions in their experience been followed by "blowing out" of the stump. Ligation with inversion is also condemned because of the danger that a localized suppurative process in the closed pocket may rupture into the peritoneal cavity. They describe a method by which they maintain that the stump may be safely and cleanly inverted without preliminary ligation. It seems desirable that further work should be carried out to establish which method of disposing of the stump of the appendix is best, as the position is quite uncertain at the moment.

[1] *The American Journal of Surgery*, July, 1939.
[2] *Archives of Surgery*, December, 1939.
[3] *The American Journal of Surgery*, December, 1939.

Abstracts from Current Medical Literature.

PATHOLOGY.

The Early Stages of Apical Scar Development.

THE opinion about the significance of the apical scars found in lungs at autopsy is about equally divided between those who believe them to be tuberculous and those who regard them as non-specific. J. Davson describes, therefore (*The Journal of Pathology and Bacteriology*, November, 1939), a thorough histological examination of 37 cases in persons aged thirty-five years or less. In only two instances was he able to find definite evidence of healed tuberculosis; on the other hand, he was able to demonstrate the complete range of development from the early stage in the form of an accumulation of dust-laden cells in the subpleural alveoli of the apex to the fully formed scars. His examinations therefore support the view that the large majority of these commonly found scars are of a non-specific origin.

Disease of the Liver in Hyperthyreoidism.

THE results of a study by J. M. Shaffer (*Archives of Pathology*, January, 1940) indicate a relationship between toxic disease of the thyreoid gland and hepatic damage. The lesions of the liver observed in 24 fatal cases of toxic thyreoid disease were loss of liver weight, fatty infiltration, cirrhosis and lymphocytic infiltration in the periportal regions, often associated with patchy fibrosis. These hepatic changes appeared with greater frequency and severity in this series of 24 cases than in a carefully studied group of 100 control cases. The average weight of the liver in the thyreotoxic group was 1,275 grammes, as compared with 1,582 grammes in the control group. Fatty infiltration was found in 92% of the cases, while in only 56% of the control group was there any evidence of this change. Evidence of a chronic inflammatory reaction was found in 83% of cases of toxic thyreoid disease, whereas the incidence in the control series was only 24%. The incidence of cirrhosis of the liver was 25% in cases of hyperthyreoidism and 4·7% in 1,431 consecutive routine necropsies. The hepatic lesions found in association with thyreotoxicosis cannot be said to result from passive venous congestion. Their production does not appear to be related to deficiencies of vitamins *B* and *C*. There is a possibility that the degenerative lesions of the renal tubules which occur in patients suffering from hyperthyreoidism may be due directly to the thyreotoxicosis or secondarily to the hepatic changes. It seems evident that more chronic lesions are found in the livers of patients with longer histories of toxic thyreoid disease. The character of the pathological changes in the liver in fatal cases of thyreotoxicosis appears sufficient to explain the clinical evidences of hepatic insufficiency.

Aschoff Bodies in Rabbits.

LEO LOEWE AND S. E. LUKE (*Journal of Experimental Medicine*, January, 1940) state that they have found striking cardiac lesions in large numbers of rabbits that they have used in experiments with material from cases of rheumatism. Many of the animals had been injected with 0·5 cubic centimetre of spinal fluid from patients with chorea and carditis. Of the 266 animals inoculated, 29·6% suffered from cardiac lesions of all grades, from verrucous endocarditis to pancarditis with scarring and degeneration of the heart muscle. The authors failed, however, to reproduce the lesions in serial transfers from animal to animal, and they also noted the occurrence of lesions in some animals that had been kept as controls, inoculated with non-rheumatic material, or else inoculated with the flora of spontaneous rabbit disease. They therefore feel considerable scepticism as to the direct relationship of the lesions to the rheumatic material inoculated into a proportion of the animals, but feel impelled to report the findings, thinking they may have come upon a rabbit counterpart of human rheumatic carditis, ætiologically distinct, although pathologically similar.

Fibrosis of the Liver in Heart Failure.

THERE is no general agreement as to whether chronic passive congestion may lead to fibrosis of the liver. T. D. Day and T. G. Armstrong (*The Journal of Pathology and Bacteriology*, March, 1940) have therefore examined the histological changes of the liver in cases in which a state of congestion had been persistent some time before death. In all eleven cases studied a persistently raised venous pressure resulted in a characteristic fibrosis of the liver. The authors state that the constancy of the finding indicates the direct connexion between the rise of venous pressure and the increased production of fibrous tissue. If the fibrosis were the result of an added toxic factor, the resulting histological picture would be expected to resemble that of an ordinary toxic cirrhosis. This resemblance was not found, and the type of fibrosis found did not resemble portal cirrhosis, modified, as it often is, by the effects of heart failure. Obliterative changes were found in branches of the hepatic vein; but the authors believe that Coronini is wrong when he holds that this change is necessarily inflammatory or indicative of a superadded infective or toxic process. The thickening of the veins is due to fibrillary increase and œdema without cellular proliferation. In making reference to the way in which passive congestion may result in fibrosis, the authors discuss the mode of formation of connective tissue fibrils. There is, they state, a growing belief that fibrils are formed extracellularly out of an amorphous substrate. One of the authors in a previous study concluded that blood vessels exuded a plastic substrate out of which fibrils were subsequently formed. Fibrosis unaccompanied by cellular proliferation is likely to occur when, as in œdema, the tissue spaces become chronically distended by the exuded substrate. In the cases studied by the authors a chronic distension of the tissue spaces was undoubtedly present. Another factor leading to the fibrous induration of organs is parenchymatous atrophy. The authors discuss this factor as illustrated in ischæmic atrophy of the kidney occurring in chronic cardio-vascular degeneration. They hold that the theory of extracellular fibrillogenesis does not imply that cells take no part in the process. In support of this statement they point out that tissue culture workers have put forward suggestive evidence that the mesenchymal cells are necessary in that they elaborate a diffusible stimulus which evokes the formation of fibrils in the surrounding substrate.

Pathological Changes following the Oral Administration of Sulphapyridine.

W. ANTOPOL AND H. ROBINSON (*Archives of Pathology*, January, 1940) describe pathological changes following the oral administration of sulphapyridine. They have previously reported the occurrence of urinary concretions in the rat, rabbit and monkey, consisting mainly of acetyl sulphapyridine, following the oral administration of sulphapyridine. In the present investigation animals were maintained on a balanced diet with sufficient water. The animals used included 400 mice, 320 rats, 16 dogs, 42 rabbits and 48 monkeys. Urinary concretions were often found in rabbits after they had received by mouth 10 to 15 grammes of sulphapyridine per kilogram of body weight, in rats after five grammes per kilogram had been given, and in monkeys after 0·25 gramme per kilogram. In mice and dogs no concretions were found, even after the administration of doses as large as 20 grammes per kilogram. Urolith formation was often unilateral and occurred on the right side oftener than on the left. Collections of crystals were often found in the ureter if the animal was killed twenty-four hours after the administration of the drug. After longer intervals larger concretions were found; these were irregularly ovoid and sometimes were elongated and formed a cast of the ureter. Sometimes the ureter was hæmorrhagic. The kidney became œdematous and enlarged. Sometimes an amorphous aggregate of crystals and fibrin completely filled the renal pelvis and extended upward into the papillary

ducts of the kidney. The bladder was often œdematous. The authors describe in detail the degenerative and inflammatory changes found in monkeys on histological examination. They also record experimental data suggesting that the obstructing crystalline mass can be either redissolved or washed out. In their discussion the authors conclude that it cannot be ascertained whether the formation of a urolith is always an independent precipitation process or whether it is at times dependent on primary degenerative or vascular changes in the kidney. Some observations on urolith formation following the administration of sodium sulphapyridine are also included in this article.

MORPHOLOGY.

Extraendothelial Cells of Blood Vessels.

E. R. CLARK AND E. L. CLARK (*The American Journal of Anatomy*, January, 1940), by their transparent chamber technique, have followed the regeneration of blood vessels in the ears of living rabbits. They report the presence of adventitial cells on the walls of regenerating vessels; the cells come from connective tissue cells. The fate of these cells depends upon that of the related vessel. If this remains capillary, the cells remain disposed longitudinally and multiply little, if at all; functionally they are inert. If the vessel becomes a venule the cells behave in much the same way. If, however, the vessel becomes an arteriole the extraendothelial cells increase rapidly in number until they may form a continuous external layer; they become disposed transversely and emerge as smooth muscle cells. Provided these cells receive a vasomotor supply, they exhibit active contractility.

Position and Mobility of the Kidneys.

R. O. MOODY AND R. G. VAN NUYS (*The Anatomical Record*, February, 1940) record the results of a radiological survey of the position of the kidneys in a series of 450 healthy men and women between the ages of eighteen and twenty-five years. In the erect posture in both sexes the cephalic pole of both kidneys is opposite the first lumbar vertebra, and the caudal pole is opposite the fourth lumbar vertebra in the great majority of cases. In 18% of men and 43% of women the cephalic pole of the right kidney is opposite the second lumbar vertebra, but that of the left does not show much variation. The caudal pole of the right kidney falls below the intercristal line into the pelvis in 23% of men and 32% of women; that of the left kidney is found in the pelvis in 11% of men and 9% of women. In the supine position in both sexes the cephalic pole of both kidneys is most commonly opposite the twelfth thoracic and the caudal pole opposite the third lumbar vertebra. The caudal pole of the right kidney falls below the third lumbar vertebra in 38% of men and 48% of women; for the left kidney the figures are 17% and 9% respectively. In 2% of the men only did the caudal poles reach the pelvis in the supine position. The relation of the renal poles to the midline may vary up to 25 millimetres. The most common kidney length is between 12 and 14 centimetres; the range of length falls between 9 and 15 centimetres. Renal excursions during forced respiration vary from 0·1 to 6·5 centimetres. The authors conclude that, like other abdominal viscera, the kidneys should be regarded as normally "floating viscera".

The Pyramidalis Muscle.

M. F. ASHLEY-MONTAGUE (*The American Journal of Physical Anthropology*, October-December, 1939) discusses the incidence of the pyramidalis muscle in the Mammalia. He considers that the pyramidalis of marsupials (which he classes as Prototheria) is not ancestral to that of the apes and man, and he concludes that the human pyramidalis is derived from the ancestral anthropoid stock. The size and variation of the pyramidalis do not appear to hold any significance. The muscle is present on one or both sides in over 80% of humans, being slightly more frequent in males than in females, and somewhat larger in whites than in Negroes. The author considers the muscle a progressive rather than a regressive human character.

The Suprarenal Glands.

C. A. SWINYARD (*The Anatomical Record*, January, 1940) has measured the volume of the suprarenal glands in a series of human subjects. He finds that the glands are significantly larger in the female than in the male, the difference depending upon the greater amount of cortex in the female. The glands in the white race are larger than those in Negroes, and again the difference depends upon the greater volume of cortex. On the other hand, the volume of medulla in the female, whether white or Negro, is less than in the male. The corticomedullary ratio averages 12·4:1 in white males, 20·4:1 in white females, 8·3:1 in Negro males, and 14·2:1 in Negro females.

Fibrous Bands in the Spinal Dural Sac.

W. D. SEYBOLD (*The Anatomical Record*, January, 1940) reports the presence of transverse bands of fibrous tissue on the ventral aspect of the cord in human subjects. These bands, which he calls anterior transverse ligaments, run transversely in a tube of arachnoid to be attached to the dura on each side, ventral to the *ligamentum denticulatum*. The bands are circular or oval in section, with a diameter of 0·1 to 0·4 millimetre, and they are invested by a layer of mesothelium. They are found only on the ventral aspect of the cord. Over 70% of adult humans showed such ligaments; these were found in the thoracic region in 70·9%, in the cervical region in 20%, and in the lumbo-sacral region in 21% of cases; in 40% they appeared in more than one region. Similar bands were demonstrated in fœtuses of five months and six months and at term; they could not be found in cats, dogs or a baboon.

Heart Muscle and the Earliest Contractions.

C. M. GOSS (*The Anatomical Record*, January, 1940) attacks the view that the appearance of striation in cardiac muscle indicates the onset of contractility. In rats he finds that contractions precede the appearance of fibrillæ and cross-striations, although these are evident soon afterwards. Goss believes that these cytological differentiations are associated less with the contractions than with a harnessing of the contractile force in order to exert mechanical pull outside the cell.

Development of the Human Suprarenal Cortex.

U. U. UOTILA (*The Anatomical Record*, February, 1940) has followed the development of the suprarenal cortex in human embryos ranging from 4 to 20 millimetres in length and in some macaque embryos. He confirms previous observations that the development occupies two stages: first, fœtal cortex, and secondly, permanent cortex. The fœtal cortex comes from proliferating mesothelium in the suprarenal groove at the seven to eight millimetre stage (20 to 25 days). The cells soon separate and form a mass of large acidophile cells. Small vessels appear in the fœtal cortex at the nine millimetre stage and increase in number and complexity to form a sinusoidal network at 14 millimetres. Permanent cortex develops from a further proliferation of mesothelial cells at the 11 to 13 millimetre stage (six to six and a half weeks). These cells are smaller and they give a basophile reaction. They multiply and spread along the surface of the gland. At the 16 to 18 millimetre stage small blood vessels are present in the periphery of the gland, while the sinusoidal vessels at the centre join to form a central vein. At this stage there is arrangement of the permanent cortex in reticular and fascicular layers covered by cortex without special subdivision. The capsule does not develop definitely until the 13 millimetre stage. Sympathetic elements appear on the dorsomedial side of the fœtal cortex at the 11 to 12 millimetre stage, but do not commence invasion until the 13 to 14 millimetre stage.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Women's Hospital, Carlton, Melbourne, on April 17, 1940. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the hospital. Parts of this report appeared in the issues of June 1 and June 8, 1940.

Demonstration of the Colorimetric Method for the Determination of Urinary Androgens.

DR. VERA KRIEGER demonstrated the colorimetric method for the determination of urinary androgens. She said that urinary androgens were extracted from twenty-four-hour samples of urine by benzol. The benzol was distilled off and the residue was dissolved in ether. The ether solution was washed with caustic soda and water. The residue, after the ether had been distilled off, was dissolved in 95% alcohol.

The colorimetric estimation was based on the chemical reaction of substances containing the $-CH_2CO$ group in alkaline alcoholic solution with metadinitrobenzene. Substances such as creatinine, œstrogens and phenols, which might interfere with the reaction, were removed in the extraction and subsequent washing. The modification of Friedgood and Whidden for colour development was the following. Aliquots of the alcoholic hormone solution were evaporated to dryness on a water bath at 70° to 75° C. After being cooled the residue was treated with 95% ethyl alcohol, 2% metadinitrobenzene, and 15% aqueous potassium hydroxide solution. A control tube with equal proportions of all these reagents was also prepared. The tubes were incubated at 25° C. in the dark for one and a quarter hours. The contents of each tube were then diluted to seven cubic centimetres with 95% alcohol.

Alcoholic extracts of urine from normal patients and from several patients with virilism were treated in the manner described and were shown in comparison with the colour developed with different concentrations of androsterone and dehydro-androsterone.

Demonstration of Shiels's Method for the Determination of Small Quantities of Lead in the Urine.

Dr. Krieger then demonstrated Shiels's method of determining small quantities of lead in the urine. Two samples of urine, each 25 cubic centimetres in volume, were acidified with 1:10 acetic acid, and one sample was also treated with calcium chloride and ammonium oxalate to precipitate any lead present. Twenty cubic centimetres of the original urine and 20 cubic centimetres of the "deleaded" urine were each treated with an extractive solution containing 1·08% potassium cyanide and 1% ammonium citrate. The alkaline mixtures were then treated with dithizone solution in pure redistilled chloroform. After shaking and subsequent separation of the layers, the chloroform layer should be green in colour in the "deleaded" sample and greenish blue, bluish purple, purple or pink in the original urine. If it was pink there was too great an excess of lead present, and dithizone solution had to be added to each sample until the original sample was bluish purple in colour. Small known quantities of dilute solutions of lead in distilled water were added to the "deleaded" sample until after they had been shaken the colours matched.

Urological Demonstration, with Particular Reference to Tuberculosis of the Urinary Tract.

DR. HAROLD MOORE showed a large hypernephroma that had been removed from a woman, aged sixty years. In addition to the specimen he demonstrated pyelograms taken before operation. These were unusual, in that the appearance was more suggestive of distortion by a large cyst, as there was no encroachment on the calyces.

Dr. Moore also showed a series of tuberculous patients to illustrate the varying manifestations of a tuberculous infection and the differing resistance of individuals to infection. Three patients illustrated the typical age at which symptoms usually appeared in tuberculosis of the urinary tract; they were aged twenty, twenty-two and twenty-four years. One had been admitted to hospital with a history of frequency of micturition and scalding of six months' duration, associated with intermittent hæmaturia. This patient had suffered from pain in the chest at intervals for two years, and two children had died at the age of six weeks from "pneumonia". Investigation revealed involvement of both sides of her chest, both kidneys and both sacro-iliac joints, and also collapse and abscess formation of the bodies of the eighth and ninth dorsal vertebræ. In her case nothing more than general treatment was attempted. The other two patients had attended the hospital complaining of painful and frequent micturition of some months' duration. On investigation each had gross involvement of one kidney without evidence of any other active focus. They both did well for a time after nephrectomy. One had a recurrence of symptoms, which was found on investigation to be due to persisting infection in the stump of the ureter. She was waiting admission to hospital for removal of this stump, and was expected to do well. The other patient had remained free from urinary symptoms, but now had a progressive chest lesion at the apex of her left lung; she also had tubercle bacilli in the sputum. Both these patients would require general treatment; but the outlook for the one without the lung involvement was obviously much better.

Dr. Moore's last patient was aged fifty-two years; she had previously been under treatment for tuberculosis of the spine. She had suffered from severe pain in the perineum and great frequency of micturition day and night for three months before her admission to hospital. Investigation proved that the left kidney was infected and practically functionless. Left nephrectomy was performed with immediate relief of symptoms.

Dr. Moore said that the interest in these cases lay primarily in the very varied response to a tuberculous infection. Another interesting point was the method of diagnosis. In the case of extensive general infection no tubercle bacilli were found in a twenty-four-hour specimen of urine; but in the light of the other findings, including the cystoscopic appearance of the bladder, the diagnosis was considered certain. In two of the other cases direct smears from a twenty-four-hour specimen of urine showed tubercle bacilli. In the other case no tubercle bacilli were found in a twenty-four-hour specimen, but there was a profuse growth of tubercle bacilli on Petragnani's medium in three weeks. A guinea-pig was inoculated at the same time as the culture was made, and the post-mortem examination of this pig confirmed the diagnosis, but only after the delay of a further six weeks. It was worth stressing that these new cultural methods were a distinct advance in the diagnosis of tuberculous infections. They often enabled a positive diagnosis to be made from material, examinations of direct smears from which consistently revealed no tubercle bacilli, and as in the case last quoted, with a considerable saving of time over guinea-pig inoculation.

X-Ray Pelvimetry.

DR. COLIN MACDONALD demonstrated the various methods of X-ray pelvimetry used at the Women's Hospital, Melbourne. Most of the work on this subject had been done in the United States of America, where pelvic abnormalities were of more frequent occurrence than in Australia, though even in this country Dr. Macdonald felt that X-ray pelvimetry might be utilized more in the prediction of difficult labour. Herbert Thoms, of the Yale University Medical School, Caldwell and Moloy, of the Sloane Hospital for Women, New York, and Robert Ball, also of New York, together with Munro Kerr, of Glasgow, were the men whose views had most impressed Dr. Macdonald, though he himself used only Thoms's technique; it had the merit of relative simplicity and did

not require expensive and complicated apparatus. It was the diameter and shape of the inlet with which Dr. Macdonald was mostly concerned, for not only could the outlet diameters be satisfactorily estimated by clinical methods, but the experience of Melbourne obstetricians led to the belief that fœtal arrest below the inlet was a rarity in that city.

In the minor non-pathological variations of the female pelvis due to racial, sexual and hereditary factors, Dr. Macdonald had found Caldwell and Moloy's classification to be very helpful, though in Australia it had to be remembered that pelvic variations were much less frequent than in the eastern States of America. For the recognition of these various types X-ray pelvimetry was essential, for neither the external pelvic measurements nor consideration of the physical type to which a woman conformed could be relied on to indicate the diameters of the true pelvis. Four types of non-pathological pelvic variations were recognized. Unfortunately Thoms's classification did not employ a nomenclature similar to that of Caldwell and Moloy, and perhaps that had led to some delay in acceptance of their valuable work.

The first type of inlet was that which was described by Caldwell and Moloy as the gynæcoid or normal female pelvis, and by Thoms as the round or mesatipellic type, in which the anterio-posterior diameter was equal to the transverse diameter, or was shorter than the transverse diameter by one centimetre or less. These women were frequently, but certainly not always, of average shoulder width, with narrow waist, broad hips and curved legs. The subpubic angle was wide with everted descending rami, and the sacrum was of the average width, length and inclination. The sacro-sciatic notch, to which Caldwell and Moloy attached considerable importance, was wide. Engagement was usually in the oblique occipito-anterior position, and delivery uneventful.

The second type was the android or male (often called the "funnel" pelvis). Thoms designated this the brachypellic or oval type, and the American observers had found it in 30% of their patients. Women with this type of pelvis had, quite often, a square torso, thick waist and straight thick legs, and were obese; frequently they suffered from menstrual disturbances and were sterile. A kidney-shaped brim was present; its widest transverse diameter was near to the sacral promontory, and so the posterior segment of the inlet was small; the antero-posterior diameter was less than the transverse diameter by one to three centimetres; the four side walls of the pelvis converged to the outlet and the subpubic angle was narrow, as was the sacro-sciatic notch; the sacral promontory projected forward, producing the kidney-shaped brim, and the posterior segment of the pubic inlet was small. The fœtal head tended to engage in a transverse or in an oblique posterior position; as the head descended in the mid-pelvis, arrest was apt to occur. Caldwell and Moloy held that recognition of this type before delivery with a child of average size was a definite indication for interference.

The third type of pelvis was the anthropoid (the dolichopellic of Thoms), and was so named because it bore a resemblance to the pelvis of the anthropoid ape. The physical type (but again it had to be emphasized that there was no constant relationship between the physical type of the woman and her pelvis) was usually that of wide shoulders, narrow hips, long torso with straight legs. The inlet had an anterio-posterior diameter greater than the transverse diameter, and the anterior part of the inlet was roughly triangular in shape. The side walls of the pelvis were straight or divergent, the subpubic angle was narrow and the sacrum was long, erect and narrow, being placed far back in the pelvis and often with six segments ("high assimilation pelvis" was the term applied in such cases). The sacro-sciatic notch was wide and shallow, and the fœtal head could engage only in the antero-posterior diameter and in the posterior position. If the head passed the inlet, difficulty would often be experienced in rotation because of the short transverse diameter. Caldwell and Moloy believed that delivery might best be accomplished by forceps with the head in the posterior position. Munro Kerr felt that the anthropoid type of pelvis should cause the obstetrician little concern, and that there was no need to rotate the head manually or by forceps.

The fourth and last type of variation was the platypelloid or non-rickety flat pelvis, and it was a rarity, though it was often confused with the android variety. In this type the antero-posterior diameter was shortened, the transverse diameter being lengthened, and the former exceeded the latter by three centimetres or more. The side walls of the pelvis were usually straight; the sacro-sciatic notch was unusually wide, but, as viewed from the directly lateral aspect, it might appear narrow, owing to the foreshortening which resulted from the flattened inlet. The fœtal head engaged in the transverse diameter, and if arrest did occur, it was low in the pelvis.

Dr. Macdonald did not employ those refined cephalometric techniques which purported to yield precise information about the size and diameter of the fœtal head. While satisfied that the pelvic diameters could be measured accurately, he was not nearly so confident about cephalometry, and this was one of the several reasons why he hesitated to sponsor the diagnosis of disproportion by any X-ray method, however much it might appeal to mathematical reasoning. He believed that a decision on disproportion could, in the majority of cases, be obtained by clinical methods supplemented by routine antero-posterior, postero-anterior and lateral radiographs. Dr. Macdonald concluded by observing that when one considered the various unpredictable factors, such as uterine contraction and cephalic mouldability, it seemed that mathematical ambition had over-reached itself in endeavouring to equate the biological act of parturition with units of the inflexible and inanimate metric system.

A MEETING of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, East Melbourne, on May 1, 1940, DR. H. C. COLVILLE, the President, in the chair.

The Medical Profession and the War.

MAJOR-GENERAL R. M. DOWNES, Director-General of Medical Services, said that he did not propose to deliver a lecture or an address, but merely to talk about the war and the relationship of the members of the Branch to the war; this was a subject that he knew was occupying the minds of the members. He said that at the same time he would like to take the opportunity of giving an account of his trusteeship as the head of the military medical service and to invite helpful criticism and to answer questions, though he reserved the right to answer questions in the manner he deemed advisable.

As a preliminary, he referred to the relationship of medical men and women to the war from the standpoint particularly of what was required of the profession by the Government and people of Australia. The requirements had to be assessed from two aspects. The aspect for which training had taken place was for mobilization for local defence in the event of war in Australia; to that had been superadded the medical requirements for an expeditionary force, which had recently occupied most of his attention.

Major-General Downes then outlined the organization of the army medical services, chiefly for the information of members who had no military experience or special knowledge of the subject. A soldier wounded in action would be treated by the regimental medical officer at the regimental aid post; the medical officer would apply a preliminary dressing to the wound and might give an injection of serum or morphine. From the aid post the soldier would be sent to the field ambulance if the wound was not merely trivial. At the field ambulance, of which there were three to a division, more treatment would be carried out, according to the policy. The present local policy was that a great deal should be done in the field ambulances. Each field ambulance had a staff of nine medical officers. If it was decided that the soldier had to be evacuated from the division, the tactical

unit of an army, he would leave the field ambulance by motor ambulance convoy and be taken to a casualty clearing station, the unit which should be regarded as the pivot of the whole scheme, where the soldier would receive early and efficient treatment to promote quick and effective healing, and if possible would return to duty with his battalion or other unit. Eight medical officers comprised the normal medical staff of a casualty clearing station. Those soldiers who were to be sent further back from the casualty clearing station would travel normally on an ambulance train; but in certain circumstances the train might not be specially comfortable or completely equipped, but one of improvised trucks with or without straw. The patients would arrive at a general hospital, staffed by about 30 medical officers and equipped normally to care for 1,200 patients, but able to take as many as 2,000 at a pinch. There would also be special hospitals for venereal diseases, orthopædic conditions, facial surgery, neurological problems and perhaps for other special classes of cases. On leaving the general or special hospital, the soldier would be sent to a convalescent depot and might go on a hospital ship to his home country, where other general hospitals and convalescent depots would be open to receive him. In addition to the treatment units, Major-General Downes explained that the service included mobile laboratories for diagnosis, depots of medical stores for supplies established both at the base and in advanced areas, and other subsidiary medical units.

Major-General Downes then explained that "mobilization" in its military sense was the process by which an army passed from a peace-time footing to a war footing. That would entail a great undertaking for Australia; successive governments had subscribed to the policy of planning for the defence of Australia and not for an expeditionary force. Mobilization meant, in Victoria alone, a change from 13 medical units in peace-time to 29 in war-time; and, inclusive of the establishment of a casualty clearing station, a general hospital and line of communication units, mobilization would raise the peace-time requirements for medical officers from Victoria from 96 to 340.

Major-General Downes then discussed the way in which mobilization was carried out. He said that there was a very large reserve of officers; but, as there were not many young men, the age groups were not right. He had been most concerned to get the younger men required as regimental medical officers, but he had experienced no difficulty with the other positions. All the positions were filled "on paper", and he was satisfied that he would find any quantity of medical men, including younger men, available if and when they were wanted. He added that medical men were included in the general population so far as the compulsory clauses in the *Defence Act* went. According to those clauses, single youths of a certain age group were to be called up first, followed by single men of a higher age group and then by married men in three separate age groups. Under the Act, full-time medical officers of civilian hospitals were exempted from military service.

Major-General Downes then drew attention to a letter appearing in *The British Medical Journal* of April 13, 1940, in which an account was given of what was to happen to medical men and women in age groups up to twenty-eight years; they were to be conscripted and the authorities were thinking seriously of calling up older medical men, because it was feared that there would be a shortage for the services. An Emergency Medical Service had been established, which had the task of looking after soldiers, but was under temporary civilian control. The situation in England had made Major-General Downes refer to the likelihood that medical men and women from Australia might be required for service there.

With reference to the mobilization of "rank and file" for the military medical service, Major-General Downes said that the situation was not so easy. There were only two reserves, the Saint John Ambulance Brigade and the Voluntary Aid Detachments, as well as a small number of trained hospital dressers and radiographic technicians. He remarked that the troops were going to have rather primitive male nursing until the personnel recruited for the purpose became trained and experienced. He added that members of the regular nursing profession seemed to be the most militant members of the community; over three thousand trained nurses had volunteered for service. He said that in the present war it was hard to divide combatants and non-combatants; but if all the nurses that wanted to go were taken, the civilian services would be severely depleted.

Major-General Downes then announced that the equipment in reserve for mobilization was sufficient for regimental aid posts and field ambulances and that the instruments and dressings for two casualty clearing stations were also held in readiness. On mobilization, equipment for general hospitals and some of the other medical units had to be bought up by purchases boards in each State, which was rather complex work. He also said that the sites planned for general hospitals and convalescent depots were allotted on mobilization, and the sites determined for casualty clearing stations were allotted in certain strategical situations in conjectured possible places of attack; but it was never forgotten that casualty clearing stations had to preserve their mobility. In peace-time commanding officers knew who their officers would be on mobilization; but, of course, it was impossible to be sure that things would go smoothly when mobilization was ordered. In general terms it had to be realized that for the mobilization of an army of the size contemplated for the defence of Australia all the arrangements would have to be made that would be necessary for a city of the size of some of our capitals. It was not easily done in Australia, on account of lack of sufficient trained administrators and of experience in the work.

Major-General Downes then spoke of the Committee for Coordination of Medical Services that had been set up in 1938 to supply medical personnel. It had succeeded the one that had faded out some years earlier, but had been revived and had had other functions tacked onto it. On that committee there were representatives of the medical services of the Navy, Army and Air Force, the Army Administrative Staff, the Federal Public Health Department, the British Medical Association and the Royal Australasian Colleges of Physicians and of Surgeons. In each State, under the chairmanship of the Deputy Director of Medical Services (D.D.M.S.), there was a branch or subcommittee of the Federal body, with representation of interested organizations and unlimited power of cooption. Those committees, of which the primary function was the allocation of medical personnel, were principally concerned with the civil requirements on mobilization. It was of interest to note that the medical profession in London had vanished into emergency places in the country; but some of the members had since been allowed to dribble back. They wanted to avoid that sort of thing in Australia and to stop the denudation even of small towns. Plans had been prepared for the replacement of medical officers called up on mobilization. Attempts were made to avoid the acceptance for service of all the men in practice in any town; but if it happened that all of them were absorbed between the three services, the State Coordination Committee would be expected to arrange for the continuance of medical service to the civilian community.

Major-General Downes informed the members that the answers they had given to the *questionnaire* that they had received were not regarded as binding, but were treated only as informative to the committee. Copies of the *questionnaire* had been addressed to 6,450 medical men and women, and 5,800 replies were received; 80% of those who replied were available for service of some kind. He explained that the Central Coordinating Committee had no power at present, but at a certain stage in the war would by proclamation pass into an executive of three persons with considerable powers. That executive would comprise representatives of the armed services, the Federal Public Health Department, and the British Medical Association in Australia. In addition to the primary function, a second function of the Central Coordinating Committee was to give consideration to hospital requirements. They had to prepare plans for hos-

pitals for civil casualties from enemy action and for extra hospitals for the army where there were shortages. Emergency beds had to be available for the army and the other fighting services before military hospitals were built or ready for occupation. There was not a single military hospital at present in existence, though there was a young militia for home defence, and an expeditionary force abroad. All the military hospitals, when built, might prove insufficient for requirements, and emergency plans must be prepared. A third function of the committee concerned equipment. The Medical Equipment Control Committee was a subcommittee of the main one and had two full-time officers. It had to look after the needs of the civilian community in war-time; to investigate the state of supplies of drugs and deal with any shortages, if possible by local production; it had power of control over import and export of equipment and drugs, but not over prices. It was fortunate that there was a stock of reserve stores for the civil community, which had been bought by the Health Department in peace-time, though the Army had since taken over its care. Articles were lent to replace shortages; but they in their turn had to be replaced in the reserve of stores. Major-General Downes mentioned that there was already quite a shortage of certain drugs and instruments; this was attributable to insufficient shipping, as their export from Great Britain to Australia was not restricted. The exchange question made it difficult to get them from non-sterling countries. As an example he instanced the shortage of "M & B 693", or sulphapyridine. He said that specific instructions had been issued in the military camps controlling the use of those drugs and indicating the limitation of their use to certain medical and surgical conditions in which they were considered specially suitable. He hoped that the medical profession would exercise the same economy, using them only where necessary and relying on sulphanilamide, of which there was no shortage, in other diseases in which "M & B 693" was not specially indicated.

Major-General Downes also discussed some of the problems associated with the Australian Imperial Force—the expeditionary force. He said that all had been able to see in the daily Press the number and variety of medical units wanted from Australia. The units comprised seven field ambulances, four general hospitals, two casualty clearing stations, probably a hospital ship, a convalescent depot and a venereal diseases hospital. The number of medical officers required for those units was 265, 93 of whom were from Victoria. To fill the appointments he had received 560 applications. It was estimated that the certain requirements for reinforcements would be 30% per year. Of course, the sending of further and further divisions would create a demand which was quite an unknown factor; if he had to make a guess he would say that it was likely that Australia would have to send abroad more than 1,000 medical men, the number sent to the Great War of 1914 to 1918. At all events, for each future division that was sent, an additional 90 medical officers would be required to go with it. The field units must be supplied with young medical officers; it was exceptional for those over the age of forty years to be appointed. Major-General Downes drew attention to the small proportion of young volunteers on the present occasion. He said that in the war of 1914 to 1918, 80% of the medical volunteers were under the age of thirty-six years; recently only 29% of those from Victoria were under that age. He had not the slightest doubt that young men would come forward when they were wanted; but the selection of juniors was a distinct difficulty, and there was not much of a surplus available at that moment. Resident medical officers at the public hospitals had been warned, however, that they would not be wanted till they had completed a year in that post. Major-General Downes went on to say that the classes of specialists needed in the army medical services included surgeons, physicians, ophthalmologists, pathologists, aurists, psychiatrists, radiologists, anæsthetists and dermatologists. The units at present being formed in Victoria and calling for medical officers were a field ambulance, a 600-bed general hospital, and six regimental units. With regard to the time at which they would be required to take up duty, he said that the medical officers for field ambulance and field units must train with the others and were wanted straight away; they were required for training purposes as well as for examinations, inoculations and treatment of the sick, and advice on the hygiene of the unit. It was also important that they should get to know their fellow officers and men and study the interior requirements of the unit to which they were attached. The regimental medical officer was a very valuable officer, and, on account of the responsibilities, the post was better filled by those a little bit older than the recently qualified man. When joining the Australian Imperial Force a medical officer no longer had the prospect of being called up and left moping in camp; he was informed definitely as soon as possible when and where his services would be required. For the general hospitals the commanding officer and registrar were called up for their particular jobs, and the remaining members of the medical staff were not disturbed from civilian practice until their services were really required for medical boards or other professional work. Major-General Downes said that the wish was there to relieve senior men or men with special responsibilities who were sent abroad; but it was not an arrangement that could be guaranteed. It was impossible to make a promise, because local shortages or shipping difficulties could not be foreseen. In the last war a certain number of one-year agreements were signed, but they had proved to be a great nuisance. The official age limit was forty years for captains, rising to fifty years for colonels; there was an unofficial maximum age limit of fifty-six years for medical officers for service abroad. The youngest man, however, was wanted. It had been noticed that most of the best surgical and medical work in the last war was done by those under or just over thirty years of age. He pointed out to those who had served in the last war that previous experience would not be of any use for long, and that the older men could not stand the strain; soon the younger ones would outmode and outlast them. Speaking generally, he would say that there were not many places made to order for those who were in the last war from the beginning, although many of them were eager to go. The general principle that was being applied in the selection of medical officers for technical posts in hospitals was that the man must have the necessary professional qualifications to apply a high degree of skill and knowledge to the treatment of the sick or wounded soldiers; but, among those having those requirements, preference would be given to the trained man who had served in peace-time. He recognized frankly that there would be many heartburnings both ways. Those appointed for field units must be young and partly trained; and those appointed for specialist jobs must either have been trained with the Army Medical Corps or have attained prominence in the technical knowledge required for the job. In the Air Force there was a great increase in the need for medical officers for local duties, including medical examinations and medical boards. The permanent establishment was 70 medical officers under existing conditions. The Navy was in a happier position, because it always had its medical officers; the peace-time and war-time footing was the same. It should not be forgotten that in time of war patients from the Navy and Air Force had to be treated in Army hospitals.

Coming next to the question as to what could be done to help the fighting services by members of the profession at present in civilian practice, Major-General Downes offered a number of suggestions. The first was that they could conduct the examination of recruits. He said that inefficient medical examination caused expense to the public and impersonation was likely to be missed; pensions money could be saved by improvements in efficiency. Last time the Australian Imperial Force was a front-line *corps d'élite*, with very few unfit men in it. The medical examination of recruits was important service, and those who undertook it must be prepared to learn the points. Another way in which medical men could be of use was to join the militia; that service was of national importance and was a valuable training ground. They could undertake

relief duty in camp; that form of service would be available at least until the end of June. They could also volunteer for military hospital work in Australia; many would be called on in that sphere, possibly for part-time work, without the need to relinquish civilian practice. They could volunteer for service in the Australian Imperial Force, Navy and Air Force. For the Army it was necessary to make written application to the D.D.M.S. in the command. Verbal applications were useless; they could not be placed on record. Medical men could also undertake the teaching of first aid; the lectures and examinations might be considered drudgery by some, but nevertheless the posts had to be filled by members of the profession, who had given and were giving valuable service to the community. They could undertake the post-graduate teaching of officers of the Australian Imperial Force; post-graduate instruction was wanted all the time and could be given only by specially qualified people. Medical women could apply for positions in the Royal Army Medical Corps; it admitted them to commissions on terms level with men in pay and in duties, but they were allowed only two-thirds of the ration, as they were not supposed to eat so much. Major-General Downes anticipated that the time would come when the Australian Army Medical Corps would employ women doctors. It might be of interest to note that conservative old England was well ahead of Australia in the admission of women to the Army; they were accepted as cooks, mess waitresses and officers' orderlies. Australia had not settled that point yet.

In his concluding remarks Major-General Downes repeated that criticism was welcomed. He realized that the onlooker saw most of the game. There was much to do and there were not many to do it. He asked those with destructive criticism to make themselves well informed. He suggested that members should approach the individual concerned directly or let the British Medical Association handle suggestions or grievances. One of the matters that was giving him concern was that, though it was obvious that they had to be established, he could not get any military hospitals built. It was difficult to adopt civil advances in the services. Finance experts insisted on "looking for the nigger in the wood-pile" and super-finance members had to be convinced of the advantages to be gained. Nevertheless, there had been extraordinary freedom in that respect in Australia. Microradiography, blood typing, transfusion equipment and wholesale inoculations had been sanctioned. The prevention of influenza had not yet been the subject of an approach; the method was being worked out, and if it was evolved it might be of very great value. It was a matter of gratification to him that many medical men were doing permanent military jobs irrespective of the sacrifice of money and practices. He wished to express his gratitude for many offers of help, and he was thankful for them whether he availed himself of them or not. He specially mentioned those who had been called upon to serve for three months in the military camps, and also those who had relieved them, as worthy of special thanks. In conclusion he expressed his heartfelt appreciation to the profession at large for moral support.

DR. GERALD WEIGALL said that he had entertained the thought that doctors over the age of sixty years were regarded as non-existent in official circles. He considered, however, that if recruits were examined by men with leisure the work would be done more thoroughly than by those who did not want to do it particularly and had to rush it. He asked whether the regulations could be stretched to permit of the examination of recruits by men like himself; he could still detect the grosser abnormalities and was quite prepared to hand his reports over to the younger men to say where he was wrong.

Major-General Downes replied that there was no age limit for medical men to undertake the work. The selection of the personnel was largely individual. He would advise Dr. Weigall either to see or to write to the D.D.M.S. concerning the matter. In Victoria the examinations of recruits were chiefly conducted by medical boards.

DR. ROY BARTRAM asked whether any action on the part of the British Medical Association would be of assistance to Major-General Downes in the matter of a practical hospital building programme.

Major-General Downes replied that he did not think so.

DR. MONA BLANCHE wished to know whether, if an influenza epidemic came or there was any other such emergency demand, the present hospitals would be evacuated for the troops or whether fresh accommodation would be available in the large military hospitals.

Major-General Downes said that at the public hospitals some beds would be made available in emergency; fresh beds would, however, also have to be found in temporary hutments or tents if the emergency occurred before the large military hospitals were available.

DR. A. E. COATES asked whether the Coordination Committee would be prepared, in certain districts, and in the present circumstances, to repair the depletion of towns through the enlistment of doctors, and he wondered what machinery existed for collaboration with the special subcommittee of the Victorian Branch Council.

Major-General Downes replied that in three of the States the local committees considered each proposed enlistment and either approved or vetoed it. In Victoria he understood that the State Committee had not been active in that regard; but activity could be evoked if the circumstances arose.

DR. HUGH C. MITCHELL drew attention to the fact that members and prospective members of the Army and Air Force were being treated in ever-increasing numbers by the honorary medical officers at the Eye and Ear Hospital. He sought information as to whether that practice was to be continued.

Major-General Downes replied that the Army covenanted to provide all attention necessary to members of the Australian Imperial Force, but so far nothing had been done to ensure army medical attention for those on leave of absence. There was no need, however, for them to go to the Eye and Ear Hospital.

DR. H. C. COLVILLE spoke of the possibilities of activity of the Branch council on military matters during the war. He said that the council had, from the outbreak of war, regarded it as a duty to help members both in civil and in military problems. He therefore endorsed what had been said by Major-General Downes about the suitability of organized action through the British Medical Association. The relief of the militia medical officers who were in camp for three months had been dealt with by arrangement between the Branch and the military authorities after the Medical Secretary had been in touch with the persons concerned. With reference to the problem of members in the military forces, Dr. Colville stated that the Federal Council of the British Medical Association in Australia had seen the necessity for continuity and had elected the Victorian members as a standing subcommittee available at all times to deal with problems as they arose. The Branch council and its executive were quite anxious to do any extra work involved in attempting to act in liaison with the medical authorities; for instance, in the selection and choice of personnel. He commented on the fact mentioned by Major-General Downes, that the younger men had not volunteered in the numbers that would have been expected; but there was an excuse for the young men, in that the requirements of the Army were not known officially by the Branch council. He invited Major-General Downes to inform the council of the age groups required from time to time, and offered the Branch office as a bureau of information for members who inquired concerning their duty in the matter. In conclusion the President said that though it was not customary to pass votes of thanks at the monthly meetings of the Branch, he wished Major-General Downes to know that the members greatly appreciated his action in coming to address them.

Major-General Downes thanked the President for what he had said, and the meeting was then closed.

Post-Graduate Work.

COURSE IN MELBOURNE FOR MEDICAL OFFICERS OF NAVY, ARMY AND AIR FORCE.

A COURSE of lectures and demonstrations intended for medical officers of the Navy, Army and Air Force has been arranged by the Melbourne Permanent Post-Graduate Committee and will be held from July 1 to July 26. The programme is as follows.

Monday, July 1.

(At the Anatomy Department, University of Melbourne.)

3 to 4.40 p.m.—Professor Sydney Sunderland: Anatomy demonstration.
5 to 6 p.m.—Sir Alan Newton: "Head Injuries".

Wednesday, July 3.

(At the Anatomy Department.)

3 to 4.30 p.m.—Professor Sunderland: Demonstration of anatomy.
5 to 6 p.m.—Mr. Victor Hurley: "General Principles of High-Explosive and Bomb Injuries; Shock, Hæmorrhage and Resuscitation".

Friday, July 5.

(At Saint Vincent's Hospital.)

9 a.m. to 1 p.m.—Mr. Thomas King: Demonstration of plaster technique applied to injuries of the upper and lower extremities.

(At the Anatomy Department, University of Melbourne.)

3 to 4.30 p.m.—Professor Sunderland: Demonstration of anatomy.
5 to 6 p.m.—Dr. W. G. D. Upjohn: "The Crushed Limb; Fractures and Joint Injuries".

Monday, July 8.

(At the Anatomy Department.)

3 to 4.30 p.m.—Professor Sunderland: Demonstration of anatomy.
5 to 6 p.m.—Mr. Balcombe Quick: "Abdominal Wounds".

Wednesday, July 10.

(At the Anatomy Department.)

3 to 4.30 p.m.—Professor Sunderland: Demonstration of anatomy.
5 to 6 p.m.—Mr. John Turner: "Anatomy of the Hand Applied to Infections and Injuries".

Friday, July 12.

(At the Anatomy Department.)

3 to 4.30 p.m.—Professor Sunderland: Demonstration of anatomy.
5 to 6 p.m.—Mr. W. Allan Hailes: Thoracic injuries.

Monday, July 15.

(At the Medical Society Hall, Albert Street, East Melbourne.)

3 to 4 p.m.—Dr. Fay Maclure: "Early Treatment of Facial, Maxillary and Mandibular Injuries".
4 to 5 p.m.—Captain C. Wallace Ross: "Blood Transfusion".
5 to 6 p.m.—Captain C. Wallace Ross: Film and demonstration.

Wednesday, July 17.

(At the Infectious Diseases Hospital, Fairfield.)

3 p.m.—Dr. F. V. Scholes: Practical demonstration of infectious diseases.

Thursday, July 18.

(At the Alfred Hospital.)

9.30 a.m. to 12.30 p.m.—Mr. Hugh Trumble: Demonstration of plaster technique.

Friday, July 19.

(At the Medical Society Hall.)

3 to 4 p.m.—Mr. Henry Mortensen: "Venereal Diseases".
5 to 6 p.m.—Mr. Henry Searby: "Infected Wounds, including Tetanus and Gas Gangrene".

Monday, July 22.

(At the Medical Society Hall.)

3 to 4 p.m.—Dr. H. F. Maudsley: "Neuroses in War-Time".
4 to 5 p.m.—Dr. L. B. Cox: "Meningitis".
5 to 5.30 p.m.—Dr. Keith Fairley: "Treatment with Sulphanilamides".

Wednesday, July 24.

(At the Medical Society Hall.)

3 to 4 p.m.—Dr. S. O. Cowen: "Diagnosis of Fever of Obscure Origin".
Dr. Hume Turnbull: "Disordered Action of the Heart".

Friday, July 26.

(At the Medical Society Hall.)

3 to 4 p.m.—Dr. Keith Colquhoun: "Skin Lesions of Importance in Military Practice".

(At the Eye and Ear Hospital, Victoria Parade, Eastern Hill.)

4.15 to 5.30 p.m.—Dr. Mark Gardner: "Treatment of Eye Injuries and Infections".

It is hoped that a series of lectures on hygiene and tropical diseases will be provided from Monday, July 29, to Friday, August 2, from 3 to 5.30 o'clock p.m. As arrangements are incomplete, a detailed programme cannot yet be published.

The course will also be open to those who are not yet on active service and to those who intend to enlist at a later date. No fee is payable and registration is unnecessary.

LECTURES IN SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that the lectures to be given by the Post-Graduate Director of Pathology, Dr. F. B. Byrom, on "Recent Work in Hypertension and Nephritis", will be held at 4.30 p.m. on Wednesdays, June 19 and 26, 1940, instead of on June 5 and 12, as previously advertised, in the lecture theatre at the Prince Henry Hospital, Little Bay.

These lectures are included in the course for the M.R.A.C.P., but may be attended by those not taking the full course on payment of a fee of 10s. 6d., which includes attendance at both lectures.

LIBRARY SEMINARS AND CLINICO-PATHOLOGICAL CONFERENCES.

LIBRARY seminars and clinico-pathological conferences, arranged by the Post-Graduate Directors of Medicine, Surgery and Pathology, are held each month at the Prince Henry Hospital, Little Bay. These meetings are held at 4.30 p.m. on the second and fourth Monday in the month, public holidays excluded.

In the meetings, which are of a quite informal nature, special attention is given to recent literature, and it is the aim of the directors to encourage free discussion on the selected subjects.

The next conference will be held on Monday, June 24, 1940. Subject: "Tumours of the Suprarenal Gland". A cordial invitation to be present is extended to all medical practitioners.

Correspondence.

"BEMAX" AND VITAMIN B_1.

SIR: My attention has only just been drawn to a report in your issue of November 18, 1939, of the proceedings of the Melbourne Pædiatric Society on September 13, 1939, in the course of which Dr. M. Kent Hughes was reported (page 777) as inquiring "whether there was any evidence that 'Bemax' contained vitamin B_1".

Notwithstanding the length of time which has elapsed since this report appeared, the matter is of such importance, not only to us but also to a very large number of medical practitioners and others who rely on "Bemax" as a source of vitamin B_1—as well as of other factors of the vitamin *B* complex and of vitamin *E et cetera*—that I trust you will be able to extend the hospitality of your columns to a reply.

As you are doubtless aware, "Bemax" has now been on the market for fully twelve years, and you yourself have tested the product and published a note as to your findings. In addition to that, an extensive organization has been built up here with the prime purpose of guaranteeing the stability and uniformity of our principal product, namely, "Bemax". It is no exaggeration to say that workers in our laboratories have achieved world-wide recognition in respect of their investigations into vitamin B_1 content of foodstuffs and other relative matters. Without giving a complete list, I need only now refer to papers which have appeared in the *Journal of Hygiene*, XXXVIII, 3, 1938 (Drummond, Baker, Wright and others), and in the same journal, XXXIX, 6, 1939 (Wright and Baker), and the *Journal of the Society of Chemical Industry*, 1937 (Baker, Wright and Drummond), and in the same journal of 1939 (Pyke); in *The Biochemical Journal*, XXIX, 7, 1935, in the same journal, XXXII, 12, 1938, and again in the same journal, XXXIII, 8, 1939, all by Baker and Wright.

I omit all reference to papers on other subjects, such as vitamin *E*, which have appeared in various journals. The findings of our workers mentioned above are now accepted as authoritative, and to illustrate this I would point out that a considerable number of the vitamin B_1 values approved by Fixsen and Roscoe, after critical examination, for inclusion in their well-known tables, emanated from our laboratories. If any further references are needed, there is the recent work "Accepted Foods" published officially by the American Medical Association, the stringency of whose standards is well known.

Having, as I trust you will agree, established the position of our laboratories in the vitamin *B* field, I should now like to recount the general nature of the supervision exercised over the selection of raw material and the finished product.

It has been established that unselected wheat germ may vary fivefold in its vitamin B_1. It is thus not possible without a vitamin assay in each case to determine whether a particular sample of wheat germ has an activity of, say, 400 international units per ounce, as has "Bemax", or an assay of only perhaps 100 or 200 I.U. per ounce, as have samples of certain other products which have been assayed in these laboratories. For this reason, since 1935, every sample of raw material coming into our factory has been individually assayed for vitamin B_1. The magnitude of this task is such that, so far as I am aware, there is no other manufacturer in any part of the world who carries out a programme of vitamin *B* assay in any way approaching that carried out as a matter of routine here. In the course of time assay work on this scale has yielded a great deal of most valuable information as to the relative value of a very large number indeed of different samples of wheat germ. The care exercised does not stop with the raw material. For over five years a representative sample of each day's output of the finished product has been assayed for vitamin B_1, and we have, therefore, data as to the vitamin activity of "Bemax", the like of which exists on no other food product. As a result of all this information it is possible for us to assert that the vitamin B_1 activity of "Bemax" is in no way diminished by the manufacturing process to which the raw material is subjected. In fact, for various reasons, such as the removal during process of relatively inert diluent matter, the finished product is actually rather more potent than the raw material.

With regard to stability, we have recently assayed by the precision methods now in use, samples of "Bemax" of which the earliest was just over twelve years old. The following are the results stated in international units per gramme.

Date of Manufacture.	Potency.
1927	11·4
1929	14·2
1931	13·1
1932	10·3
1933	14·2
1935	11·4
1936	13·1
1937	14·2
1938	11·4
1939	13·7

In conclusion, I suggest that it has been established conclusively that:

1. There is no loss of vitamin B_1 in "Bemax" during process of manufacture.
2. Vitamin B_1 in "Bemax" is completely stable even after a lapse of twelve years.
3. The vitamin B_1 activity of "Bemax" is uniform and greater than that of average samples of wheat germ, owing to the elimination by us of all low-grade samples.

I must apologize for such a lengthy communication, but I find it difficult to do justice to the subject in any briefer form.

Yours, etc.,

VITAMINS LIMITED.

H. C. H. Graves,

Chairman and Managing Director.

26, Upper Mall,
Hammersmith,
London, W.6.
April 26, 1940.

THE ANIMAL BREEDER, THE FARMER AND THE DOCTOR.

SIR: Your leading article in the issue for May 18, 1940, on "The Animal Breeder, the Farmer and the Doctor", is both stimulating and informative.

Regarding the ætiology of laminitis of horses, I would, however, draw your attention to the work of Akerblom (1934), which is discussed in an annotation in *The Australian Veterinary Journal* for December, 1937.

So far as I am aware, Akerblom's work has not yet been subjected to experimental examination by others, but he claims, with a fair body of experimental evidence to support his contention, that the condition is essentially an alimentary histaminosis due to bacterial decarboxylation of histidine, of which the known laminitis-producing grains and fodders are rich sources.

Although Akerblom worked with rye, it is likely that his results and claims apply equally well to wheat and other laminitogenic grains, and that the production of laminitis is dependent upon (*a*) over-indulgence, with the presence of large amounts of incompletely digested and absorbed wheat in the small intestine, (*b*) the presence of decarboxylating microorganisms, and (*c*) the specific sensitiveness of the laminal capillaries of horses to histamine.

Yours, etc.,

A. W. TURNER,
Officer-in-Charge.

Division of Animal Health and Nutrition,
Animal Health Research Laboratory,
Parkville,
Melbourne, N.2.
May 28, 1940.

DERMATOLOGY IN WAR-TIME.

SIR: Up to the present medical men practising in diseases of the skin have been informed that there is no need of their services as dermatologists in the new Australian Imperial Force. This decision on the part of the Army authorities is very hard to understand.

In all wars various diseases of the skin have flourished among the troops. Scabies often goes under the name of the "soldier's itch". Syphilis is also favoured by war-time conditions, and is definitely increasing at present in the civil and military population. Body lice always infest armies in the field in every war and carry disease. Foot ringworm is very prevalent among young men of military age in Australia, and latent cases will certainly be stirred into acute exacerbation when troops have to march long distances in hot weather. This disease alone will put a large number of men out of action unless special care and attention are given.

Seborrhœic dermatitis will also surely be responsible for a notable amount of disability in hot weather among soldiers wearing heavy clothes, sweating freely, and unable to bathe frequently.

I have mentioned only a few of the dermatological problems which will have to be faced.

By way of illustration, my son, a medical officer with the Australian Imperial Force in Palestine, has written to inform me that all I prophesied about tinea has turned out correct, "only more so".

To distinguish syphilis from other diseases of the skin with speed and accuracy one requires a training in dermatology. The problems of diagnosis and treatment of the tinea (epidermophyton) infections, and of the other conditions mentioned can only be solved satisfactorily if the medical officer can call upon the help of a trained dermatologist.

At the Prince Henry Hospital during the last few months there have been admitted under me numerous cases of scabies from the various training camps. The resident medical officer informs me that some twelve patients have come from a single hut at Ingleburn.

The men do not always get the same blankets, and one man with scabies can infect all his hut mates.

When the patients come to hospital we clear their scabies up in three or four days and sterilize what clothes they bring with them to hospital. But they go back to use blankets and to wear clothes that have not been sterilized, and some second infections have occurred.

This is not the fault of the staff of the Prince Henry Hospital, but the result of the lack of organization at the camps.

It is not fair that the regimental medical officer should be responsible for guarding against reinfection.

Every division, or at least every army corps, would seem to require at least one trained dermatologist to establish a depot for sterilizing all clothing and blankets and to organize a de-lousing station, as well as to diagnose the nature and advise on the treatment of the various skin affections which will surely harass the troops.

Yours, etc.,

E. H. MOLESWORTH, M.D.,
Lecturer in Diseases of the Skin, University of Sydney.

Sydney.
(Undated.)

A DISCLAIMER.

SIR: I wish to dissociate myself from the recent notices relative to myself in the Sydney Press. Neither directly nor indirectly was I in any way connected with these notices.

Yours, etc.,

ROWLAND PITTAR,
Ophthalmic Surgeon.

Bank Chambers,
17, Bolton Street,
Newcastle.
June 5, 1940.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments have been promulgated in the *Commonwealth of Australia Gazette*, Number 96, of May 30, 1940.

PERMANENT NAVAL FORCES OF THE COMMONWEALTH (SEA-GOING FORCES).

Promotion.—Surgeon Lieutenant-Commander John Reid Hasker is promoted to the rank of Surgeon Commander (Provisional), dated 8th May, 1940.

CITIZEN NAVAL FORCES OF THE COMMONWEALTH.

Royal Australian Naval Reserve.

Promotion.—Surgeon Lieutenant-Commander Clive Henry Reynolds James is promoted to the rank of Surgeon Commander, dated 20th February, 1940.

Obituary.

RODERICK MACDONALD.

DR. RODERICK MACDONALD, whose death was recently announced in this journal, was the third son of Norman Macdonald, of Inverness-shire, Scotland, and was born in 1861. He attended the Glasgow Academy prior to entering the Glasgow University, from which he graduated with the degrees of Bachelor of Medicine and Master of Surgery at the early age of twenty-one. In 1886 he enlisted as troopship surgeon going to Alexandria during the Egyptian war, and later practised in Inverness-shire for one year before coming to Australia. On arrival in Australia, Macdonald became assistant to the late Alexander Jarvie Hood, who was at that time practising at Maclean, Clarence River, New South Wales. Later he went to the Tweed River, where his practice extended from Tweed Heads to Murwillumbimby. He was at the time the only medical man in these districts and worked over this area, travelling the long distances on horseback, being often as long as seventeen hours in the saddle and sometimes covering as many as eighty or ninety miles in a day. In 1896 Macdonald went to Western Australia, but returned soon afterwards to take over the practice of the late Dr. Lightoller in Ipswich, Queensland. In this city he practised until 1914, Dr. M. S. Patterson becoming his partner in 1913, and in 1914 he enlisted for overseas service. He was on active service with the Australian Army Medical Corps in Egypt and Gallipoli until 1918, being demobilized with the rank of colonel and having been mentioned in dispatches. On his return to Australia he took over an easy seaside practice at the Tweed Heads, but shortly afterwards retired and took up station life in south-western Queensland, where he had leisure to indulge and enjoy his general country interests. Game shooting, of which he had done much on his native moors, was one of his favourite activities, and he was much interested in raising all classes of pure-bred stock.

In January of 1940 Macdonald became a medical officer with the second Australian Imperial Force at Redbank Camp, Queensland.

Being of a particularly happy and affectionate disposition, Roderick Macdonald had innumerable friends and displayed to an unusual degree the Highland quality of intense love for his own home. In 1893 he married Louisa, daughter of the late Reverend B. G. Wilson, of Brisbane. Mrs. Macdonald and a family of three sons and three daughters survive him.

JOHN IGNATIUS PARER.

WE regret to announce the death of Dr. John Ignatius Parer, which occurred on June 4, 1940, at Sydney, New South Wales.

FREDERICK CHARLES HIGGINS.

We regret to announce the death of Dr. Frederick Charles Higgins, which occurred on June 5, 1940, at Emu Plains, New South Wales.

JOHN GOODWIN WATSON HILL.

We regret to announce the death of Dr. John Goodwin Watson Hill, which occurred on June 9, 1940, at Killara, New South Wales.

Nominations and Elections.

The undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Horan, Francis James, M.B., B.S., 1933 (Univ. Sydney), St. George Street, Mungindi.

Diary for the Month.

JUNE 18.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 19.—Western Australian Branch, B.M.A.: Branch.
JUNE 20.—New South Wales Branch, B.M.A.: Clinical meeting.
JUNE 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 26.—South Australian Branch, B.M.A.: Annual meeting.
JUNE 26.—Victorian Branch, B.M.A.: Council.
JUNE 27.—New South Wales Branch, B.M.A.: Branch.
JUNE 28.—Queensland Branch, B.M.A.: Council.
JUNE 28.—Tasmanian Branch, B.M.A.: Council.
JULY 2.—New South Wales Branch, B.M.A.: Council (Quarterly).
JULY 3.—Western Australian Branch, B.M.A.: Council.
JULY 3.—Victorian Branch, B.M.A.: Branch.
JULY 4.—South Australian Branch, B.M.A.: Council.
JULY 5.—Queensland Branch, B.M.A.: Branch.
JULY 9.—Tasmanian Branch, B.M.A.: Branch.
JULY 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee; Organization and Science Committee.
JULY 12.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. K. B. Shallard has been appointed Government Medical Officer at Coolangatta, Queensland.

* * *

Dr. J. A. Manion has been appointed Assistant Honorary Surgeon at the Liverpool State Hospital and Home, New South Wales.

* * *

Dr. J. J. Gard, Dr. G. J. Byrne (Gladstone, Queensland), Dr. W. Muir (Fremantle, Western Australia), and Dr. H. G. Dicks (Port Hedland, Western Australia) have been appointed Medical Inspectors of Seamen, according to the provisions of the *Navigation Act*, 1912-1935.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xiv-xvii.

ROYAL ALEXANDRA HOSPITAL FOR CHILDREN, SYDNEY, NEW SOUTH WALES: Honorary Medical Staff.
SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Staff Vacancies.
SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.
THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Resident Medical Officers.
THE OTAGO HOSPITAL BOARD, DUNEDIN, NEW ZEALAND: Junior Assistants.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	Associated Medical Services Limited. All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Federated Mutual Medical Benefit Society. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	Wiluna Hospital. All Contract Practice Appointments in Western Australia.

Editorial Notices.

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